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May 10, 1973 9

GOVERNMENT REPORTS ANNOUNCEMENTS

CODEN: GVRAA

U.S. DEPARTMENT OF COMMERCE

National Technical Information Service

GOVERNMENT REPORTS ANNOUNCEMENTS

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	Domestic	Foreign
Government Reports Announcements (GRA)	**$52.50**	**$67.50**
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GOVERNMENT REPORTS ANNOUNCEMENTS

Volume 73, Number 9 ◈◈◈ May 10, 1973

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INTRODUCTION

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Announcements in this journal are arranged in the 22 subject fields recommended in the Committee on Scientific and Technical Information (COSATI) Subject Category List (AD-612 200). Each field is subdivided into groups.

A 'Locator List' at the end of the journal gives the COSATI field and group location for each report cited in the issue. This list is arranged alphanumerically by accession number. An 'Edge Index' on the back cover provides easy access to the subject fields within the journal.

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INDEXES *Government Reports Index (GRI)* is published concurrently with GRA and indexes the GRA abstracts by Corporate Author, Subject, Personal Author, Contract Number, and Accession/Report Number.

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SUBJECT FIELD AND GROUP STRUCTURE

(Use Edge Index on back cover to locate subject field in the journal)

FIELD 1. AERONAUTICS. Includes the following Groups: Aerodynamics; Aeronautics; Aircraft; Aircraft Flight Control and Instrumentation; Air Facilities.

FIELD 2. AGRICULTURE. Includes the following Groups: Agricultural Chemistry; Agricultural Economics; Agricultural Engineering; Agronomy and Horticulture; Animal Husbandry; Forestry.

FIELD 3. ASTRONOMY AND ASTROPHYSICS. Includes the following Groups: Astronomy; Astrophysics; Celestial Mechanics.

FIELD 4. ATMOSPHERIC SCIENCES. Includes the following Groups: Atmospheric Physics; Meteorology.

FIELD 5. BEHAVIORAL AND SOCIAL SCIENCES. Includes the following Groups: Administration and Management; Documentation and Information Technology; Economics; History, Law, and Political Science; Human Factors Engineering; Humanities; Linguistics; Man-machine Relations; Personnel Selection, Training, and Evaluation; Psychology (Individual and Group Behavior); Sociology.

FIELD 6. BIOLOGICAL AND MEDICAL SCIENCES. Includes the following Groups: Biochemistry; Bioengineering; Biology; Bionics; Clinical Medicine; Environmental Biology; Escape, Rescue, and Survival; Food, Hygiene and Sanitation; Industrial (Occupational) Medicine; Life Support; Medical and Hospital Equipment; Microbiology; Personnel Selection and Maintenance (Medical); Pharmacology; Physiology; Protective Equipment; Radiobiology; Stress Physiology; Toxicology; Weapon Effects.

FIELD 7. CHEMISTRY. Includes the following Groups: Chemical Engineering; Inorganic Chemistry; Organic Chemistry; Physical Chemistry, Radio and Radiation Chemistry.

FIELD 8. EARTH SCIENCES AND OCEANOGRAPHY. Includes the following Groups: Biological Oceanography; Cartography; Dynamic Oceanography; Geochemistry; Geodesy; Geography; Geology and Mineralogy; Hydrology and Limnology; Mining Engineering; Physical Oceanography; Seismology; Snow, Ice, and Permafrost; Soil Mechanics; Terrestrial Magnetism.

FIELD 9. ELECTRONICS AND ELECTRICAL ENGINEERING. Includes the following Groups: Components; Computers; Electronic and Electrical Engineering; Information Theory; Subsystems; and Telemetry.

FIELD 10. ENERGY CONVERSION (Non-propulsive). Includes the following Groups: Conversion Techniques; Power Sources; Energy Storage.

FIELD 11. MATERIALS. Includes the following Groups: Adhesives and Seals; Ceramics, Refractories, and Glasses; Coatings, Colorants, and Finishes; Composite Materials; Fibers and Textiles; Metallurgy and Metallography; Miscellaneous Materials; Oils, Lubricants, and Hydraulic Fluids; Plastics; Rubbers; Solvents, Cleaners, and Abrasives; Wood and Paper Products.

FIELD 12. MATHEMATICAL SCIENCES. Includes the following Groups: Mathematics and Statistics; Operations Research.

FIELD 13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING. Includes the following Groups: Air Conditioning, Heating, Lighting, and Ventilating; Civil Engineering; Construction Equipment, Materials, and Supplies; Containers and Packaging; Couplings, Fittings, Fasteners, and Joints; Ground Transportation Equipment; Hydraulic and Pneumatic Equipment; Industrial Processes; Machinery and Tools; Marine Engineering; Pumps, Filters, Pipes, Fittings, Tubing, and Valves; Safety Engineering; Structural Engineering.

FIELD 14. METHODS AND EQUIPMENT. Includes the following Groups: Cost Effectivcness; Laboratories, Test Facilities, and Test Equipment; Recording Devices; Reliability; Reprography.

FIELD 15. MILITARY SCIENCES. Includes the following Groups: Antisubmarine Warfare; Chemical, Biological, and Radiological Warfare; Defense; Intelligence; Logistics; Nuclear Warfare; Operations, Strategy, and Tactics.

FIELD 16. MISSILE TECHNOLOGY. Includes the following Groups: Missile Launching and Ground Support; Missile Trajectories; Missile Warheads and Fuses; Missiles.

FIELD 17. NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES. Includes the following Groups: Acoustic Detection; Communications; Direction Finding; Electromagnetic and Acoustic Countermeasures; Infrared and Ultraviolet Detection; Magnetic Detection; Navigation and Guidance; Optical Detection; Radar Detection; Seismic Detection.

FIELD 18. NUCLEAR SCIENCE AND TECHNOLOGY. Includes the following Groups: Fusion Devices (Thermonuclear); Isotopes; Nuclear Explosions; Nuclear Instrumentation; Nuclear Power Plants; Radiation Shielding and Protection; Radioactive Wastes and Fission Products; Radioactivity; Reactor Engineering and Operation; Reactor Materials; Reactor Physics; Reactors (Power); Reactors (Non-power); SNAP Technology.

FIELD 19. ORDNANCE. Includes the following Groups: Ammunition, Explosives, and Pyrotechnics; Bombs; Combat Vehicles; Explosions, Ballistics, and Armor; Fire Control and Bombing Systems; Guns; Rockets; Underwater Ordnance.

FIELD 20. PHYSICS. Includes the following Groups: Acoustics; Crystallography; Electricity and Magnetism; Fluid Mechanics; Masers and Lasers; Optics; Particle Accelerators; Particle Physics; Plasma Physics; Quantum Theory, Solid Mechanics; Solid-state Physics; Thermodynamics; Wave Propagation.

FIELD 21. PROPULSION AND FUELS. Includes the following Groups: Air-breathing Engines; Combustion and Ignition; Electric Propulsion; Fuels; Jet and Gas Turbine Engines; Nuclear Propulsion; Reciprocating Engines; Rocket Motors and Engines; Rocket Propellants.

FIELD 22. SPACE TECHNOLOGY. Includes the following Groups: Astronautics; Spacecraft; Spacecraft Trajectories and Reentry; Spacecraft Launch Vehicles and Ground Support.

REPORTS & TRANSLATIONS

1. AERONAUTICS

1A. Aerodynamics

N73-15986 PC$3.00/MF$0.95
Washington Univ., Seattle.
A TWO-DIMENSIONAL, ITERATIVE SOLUTION FOR THE JET FLAP.
A. C. Herold. Feb 73, 48p NASA-CR-2190
Contract NGL-48-002-010

Descriptors: *Aerodynamic characteristics, *Jet flaps, *Lift augmentation, *Wing slots, Aerodynamic configurations, Numerical analysis, Two dimensional flow.

For abstract, see STAR 11 07.

N73-15987 PC$3.00/MF$0.95
National Aeronautics and Space Administration, Washington, D.C.
ON PEAKY AIRFOIL SECTIONS.
J. Sato. Feb 73, 43p NASA-TT-F-749
Tran- Transl. Into English From J. Jap. Soc. Aeronaut. Space Sci. (Japan), V. 18, No. 201, Oct. 1970 P 374-388

Descriptors: *Aerodynamic characteristics, *Airfoil profiles, *Shock waves, *Supersonic speeds, Aerodynamic configurations, Supercritical wings, Supersonic airfoils.

For abstract, see STAR 11 07.

N73-15988 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
SUBSONIC CHARACTERISTICS OF A TWIN-JET SWEPT-WING FIGHTER MODEL WITH MANEUVERING DEVICES.
E. J. Ray, and E. G. Hollingsworth. Jan 73, 292p
NASA-TN-D-6921, L-8221

Descriptors: *Aerodynamic characteristics, *Fighter aircraft, *Leading edge slats, *Swept wings, *Wind tunnel models, Aerodynamic configurations, Aircraft performance, Aircraft stability.

For abstract, see STAR 11 07.

N73-16012 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
THE EFFECTS OF CONFIGURATION CHANGES ON THE AERODYNAMIC CHARACTERISTICS OF A FULL-SCALE MOCKUP OF A LIGHT TWIN ENGINE AIRPLANE.
M. P. Fink, J. P. Shivers, H. D. Greer, and J. L. Megrail. Sep 72, 223p NASA-TN-D-6896, L-8375

Descriptors: *Aerodynamic characteristics, *Aerodynamic configurations, *Light aircraft, *Wind tunnel stability tests, Aerodynamic coefficients, Aircraft performance, Angle of attack.

For abstract, see STAR 11 07.

1B. Aeronautics

AD-757 174 PC$3.75/MF$0.95
Federal Aviation Administration Washington D C Office of Aviation Economics
AVIATION FORECASTS. FISCAL YEARS 1973--1984.
Sep 72, 48p
See also report dated Sep 71, AD-738 360.

Descriptors: (*Civil aviation, Predictions), Air traffic, Aircraft engines, Aircraft industry, Fuel consumption, Airports, Air traffic control systems, Pilots.
Identifiers: Forecasting, General aviation aircraft.

Contents:
Aviation industry forecasts (Air carrier traffic; Air carrier fleet;
General aviation flying and aircraft fleet;
Domestic aviation fuel consumption;
Civil aircraft and engine production);
FAA air traffic activity forecasts;
Airmen forecasts.

N73-15984 PC$3.00
National Aeronautics and Space Administration, Washington, D.C.
AERONAUTICAL ENGINEERING A SPECIAL BIBLIOGRAPHY WITH INDEXES, SUPPLEMENT 23, OCTOBER 1972.
Oct 72, 112p NASA-SP-7037 (23)

Descriptors: *Aerodynamics, *Aeronautical engineering, *Bibliographies, Aeronautics, Aircraft design, Aircraft engines, Ground support equipment.

For abstract, see STAR 11 07.

N73-16007 PC$5.50/MF$0.95
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
COMPUTER PROGRAMS FOR ESTIMATION OF STOL TAKEOFF, LANDING, AND STATIC PERFORMANCE.
S. E. Post. Dec 72, 66p NASA-TM-X-62217
Subm- Prepared in Cooperation With Army Air Mobility R and D Lab., Moffett Field, Calif.

Descriptors: *Aerodynamic characteristics, *Aircraft performance, *Computer programs, *Short takeoff aircraft, Aerodynamic configurations, Direct lift controls, Lift augmentation.

For abstract, see STAR 11 07.

N73-16009 PC$17.75/MF$0.95
Aerospace Corp., El Segundo, Calif. Air Transportation Group.
STUDY OF V/STOL AIRCRAFT IMPLEMENTATION. VOLUME 2 APPENDICES.
A. Androsky, S. C. Miller, J. A. Neiss, W. J. Portenier, and H. M. Webb. Nov 72, 315p
NASA-CR-114518, ATR-73 (7303)-1-VOL-2-APP
Contract NAS2-6473

Descriptors: *Airline operations, *Commercial aircraft, *Short haul aircraft, *V/stol aircraft, Cost analysis, Production engineering, Terminal facilities.

For abstract, see STAR 11 07.

N73-16014 PC$5.50/MF$0.95
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
PITCH ATTITUDE, FLIGHT PATH, AND AIRSPEED CONTROL DURING APPROACH AND LANDING OF A/ POWERED LIFT STOL AIRCRAFT.
J. A. Franklin, and R. C. Innis. Dec 72, 68p
NASA-TM-X-62203

Descriptors: *Aircraft landing, *Approach control, *Flight paths, *Flight simulators, *Short takeoff aircraft, Aircraft performance, Aircraft stability, Flight control, Pilot performance.

For abstract, see STAR 11 07.

N73-16016 PC$4.00/MF$0.95
Messerschmitt-boelkow-blohm G.H.B.H., Hamburg (West Germany).
RECENT STUDIES ON METEOROLOGICAL ICING PARAMETERS . NEUERE UNTERSUCHUNGEN AUF DEM GEBIET DER METEOROLOGISCHEN VEREISUNGSPARAMETER.
W. Kleuters. 12 Sep 72, 37p MBB-UH-11-72-O, DGLR-PAPER-72-109
Conf- Presented At the 5th Dglr Ann. Meeting, Berlin, 4-6 Oct. 1972
Language German

Descriptors: *C-160 aircraft, *Ice formation, Atmospheric temperature, Drop size, Meteorological parameters, Moisture content, Statistical analysis, Turbine engines.

For abstract, see STAR 11 07.

N73-16018 PC$3.25/MF$0.95
Messerschmitt-boelkow-blohm G.H.B.H., Hamburg (West Germany).
INFLUENCE OF AIRWORTHINESS REGULATIONS ON TAKEOFF AND LANDING PERFORMANCE OF QSTOL AIRCRAFT . EINFLUSS VON LUFTTUECHTIGKEITSVORSCHRIFTEN AUF DIE START - UNG LANDELEISTUNGEN VON QSTOL-FLUGZEUGEN.
H. G. Klug. 20 Sep 72, 25p MBB-UH-13-72-O, DGLR-PAPER-72-056
Conf- Presented At the 5th Dglr Ann. Meeting, Berlin, 4-6 Oct. 1972
Language German

Descriptors: *Aircraft reliability, *Regulations, *Short takeoff aircraft, Aircraft landing, Aircraft performance, Externally blown flaps, Takeoff runs.

For abstract, see STAR 11 07.

N73-16943 PC$6.50/MF$0.95
Aeronautical Research Labs., Melbourne (Australia).
AERONAUTICAL RESEARCH AND DEVELOPMENT.
Annual Report, 1971 - 1972
1972, 90P
Misc- Original Contains Color Illustrations

Descriptors: *Aeronautical engineering, *Research and development, Aerodynamics, Aircraft engines, Aircraft instruments, Aircraft structures, Human factors engineering.

For abstract, see STAR 11 07.

PB-215 621/4 PC$3.00/MF$0.95
Operations Research, Inc., Silver Spring, Md.
CRITERIA FOR EVALUATION OF SYSTEM CONCEPTS.
Interim rept.
11 Feb 72, 94p
Contract CON-AAC-71-03

Descriptors: (*Air transportation, Evaluation), (*Airports, Systems analysis), Standards, Air cargo, Cargo transportation, Air traffic control, Management planning, Services, Aircraft.

The report defines and describes a set of evaluation criteria to provide a basis for the evaluation of alternative aviation system concepts. These criteria are presented in quantitative and qualitative categories.

PB-215 803/8 PC$12.50/MF$0.95
Aviation Advisory Commission, Washington, D.C.
THE LONG RANGE NEEDS OF AVIATION. TECHNICAL ANNEX TO THE REPORT OF THE AVIATION ADVISORY COMMISSION. VOLUME I.
Jan 73, 599p*
See also Volume 2, PB-215 804.

Descriptors: (*Civil aviation, Management analysis), Commercial aircraft, General aviation aircraft, Airspace, Air traffic control, Airports, Cost analysis, Government policies, Aerospace industry, Noise reduction, Land use, Abstracts.

The findings and recommendations of the Aviation Advisory Commission are contained in its report entitled 'The Long Range Needs of Aviation', dated January 1, 1973. In the process of arriving at these findings and recommendations, the Commission took into consideration, among other things, an extensive body of information developed for it by its staff, consultants, contractors, and many informed and concerned persons who communicated directly with the Commission or participated in discussions and conferences sponsored by the Commission on matters of particular interest. The purpose of this technical annex is to provide, for those interested in the additional depth and detail of the foundation underlying the Commission's studies; the more significant background material developed by the various sources of information. (Author)

PB-215 804/6 PC$10.60/MF$0.95
Aviation Advisory Commission, Washington, D.C.
THE LONG RANGE NEEDS OF AVIATION. TECHNICAL ANNEX TO THE REPORT OF THE AVIATION ADVISORY COMMISSION. VOLUME II.
Jan 73, 472p
See also Volume 1, PB-215 803.

Descriptors: (*Civil aviation, Management analysis), Commercial aircraft, General aviation aircraft, Airspace, Air traffic control, Airports, Cost analysis, Government policies, Aerospace industries, Noise reduction, Land use, Abstracts.

The findings and recommendations of the Aviation Advisory Commission are contained in its report entitled 'The Long Range Needs of Aviation', dated January 1, 1973. The purpose of this technical annex is to provide, for those interested in the additional depth and detail of the foundation underlying the Commission's studies; the more significant background material developed by the various sources of information. (Author Modified Abstract)

PB-215 893/9 PC$6.00/MF$0.95
Battelle Columbus Labs., Ohio.
A STUDY OF THE EXISTING AVIATION SYSTEM AND ITS EXTENSIONS. PART A - SUMMARY.
Final rept.
28 Jan 72, 199p*
Contract CON-AAC-72-05
Supersedes report dated 17 Dec 71.
Paper copy also available from NTIS $24.45/set of 6 reports as PB-215 892-SET. See also Part B, PB-215 894.

Descriptors: (*Civil aviation, *Reviews), Air transportation, Commercial aircraft, General aviation aircraft, Airports, Air traffic, Air traffic control, Urban transportation, Vehicular traffic, Urban planning, Forecasting.

The objectives of the study were to describe the existing aviation system (primarily in terms of performance and capacity), describe current plans for improving the system, indicate the improvements which will result from implementation of these plans, and to identify additional evolutionary improvements, not presently planned, and indicate the degree of benefit to be expected from such improvements. A description of economic, regulatory and managerial aspects of the system was desired as well. The study comprises 6 separate volumes -- Part A - Summary, Part B - The Air Vehicle Element, Part C - The Airport Element, Part D - The Airspace Element, Part E - The Ground Access Element, Part F - Diversionary Ground Modes. (Author)

PB-215 894/7 PC$4.85/MF$0.95
Battelle Columbus Labs., Ohio.
A STUDY OF THE EXISTING AVIATION SYSTEM AND ITS EXTENSIONS. PART B - THE AIR VEHICLE.
Final rept.
28 Jan 72, 77p
Contract CON-AAC-72-05
Paper copy also available from NTIS $24.45/set of 6 reports as PB-215 892-SET. See also Part C, PB-215 895.

Descriptors: (*Aircraft, Civil aviation), (*Civil aviation, *Reviews), General aviation aircraft, Commercial aircraft, Airframes, Avionics, Aircraft engines, Flight crews, Airborne operations, Flight plans, Aviation safety, Predictions.

As a major component of the national aviation system, the air vehicle element is, unlike the other elements, largely privately owned and operated. It is considered to include the aircraft and its subsystems, the flight crew, and the functions, rules, regulations, and procedures attendant to its operation. The aircraft involved range the spectrum from small to large, and encompass such generic types as CTOL, STOL, VTOL, and other hybrids of these. The treatment given the air-vehicle element is limited to usages involving the transport of passengers, cargo, and mail between airports. Accordingly, stress is placed on civil aviation with only marginal consideration being given to military air transportation. Operationally, ground operation is treated as well as flight operations.

PB-215 895/4 PC$4.85/MF$0.95
Battelle Columbus Labs., Ohio.
A STUDY OF THE EXISTING AVIATION SYSTEM AND ITS EXTENSIONS. PART C - THE AIRPORT ELEMENT.
Final rept.
28 Jan 72, 78p
Contract CON-AAC-72-05
Paper copy also available from NTIS $24.45/set of 6 reports as PB-215 892-SET. See also Part D, PB-215 896.

Descriptors: (*Airports, Civil aviation), (*Civil aviation, Reviews), Aircraft landing areas, Taxiways, Passenger terminals, Access roads, Terminal air traffic control, Jet engine noise, Air pollution, Land use, Materials handling, Predictions.
Identifiers: Noise exposure.

The first three sections of the report are introductory; they define the airport element as used in these studies and briefly review the historical development of airports. The next three sections cover the four major tasks: description of the existing system, plans for improvement of the system and the expected results of those improvements, and additional evolutionary improvements, not currently planned.

PB-215 896/2 PC$6.00/MF$0.95
Battelle Columbus Labs., Ohio.
A STUDY OF THE EXISTING AVIATION SYSTEM AND ITS EXTENSIONS. PART D - THE AIRSPACE ELEMENT.
Final rept.
28 Jan 72, 184p
Contract CON-AAC-72-05
Paper copy also available from NTIS $24.45/set of 6 reports as PB-215 892-SET. See also Part E, PB-215 897.

Descriptors: (*Air traffic control, Civil aviation), (*Civil aviation, Reviews), Commercial aircraft, General aviation aircraft, Terminal air traffic control, Air route traffic control, Air traffic controllers, Aviation personnel, Cost analysis, Aviation safety, Collision avoidance, Predictions.

The report is intended to describe the airspace element as it exists today and its characteristics, describe plans for improving the present airspace element and its expected characteristics after the plans are implemented, and describe improved equipments and concepts that can provide additional capabilities to the planned system.

PB-215 897/0 PC$4.50/MF$0.95
Battelle Columbus Labs., Ohio.
A STUDY OF THE EXISTING AVIATION SYSTEM AND ITS EXTENSIONS. PART E - THE GROUND ACCESS ELEMENT.
Final rept.
28 Jan 72, 70p
Contract CON-AAC-72-05
Paper copy also available from NTIS $24.45/set of 6 reports as PB-215 892-SET. See also Part F, PB-215 898.

Descriptors: (*Airports, *Transportation), (*Civil aviation, *Reviews), Passenger terminals, Access roads, Traffic surveys, Materials handling, Passenger transportation, Diurnal variations, Vehicular traffics, Predictions.

At a few major hub airports today, ground access is either the limiting factor on airport capacity or is rapidly becoming so. As airport/airways/aircraft productivity are increased, ground access will become even more critical. The report is intended to define the performance characteristics of present and near-term ground access systems as an input to AAC's overall planning process.

PB-215 898/8 PC$4.50/MF$0.95
Battelle Columbus Labs., Ohio.
A STUDY OF THE EXISTING AVIATION SYSTEM AND ITS EXTENSIONS. PART F - DIVERSIONARY GROUND MODES.
Final rept.
28 Jan 72, 70p
Contract CON-AAC-72-05
Paper copy also available from NTIS $24.45/set of 6 reports as PB-215 892-SET. See also Part E, PB-215 897.

Descriptors: (*Airports, *Transportation), (*Civil aviation, *Reviews), Access roads, Passenger transportation, Highway transportation, Rail transportation, Urban transportation, Route surveys, Traffic surveys, Predictions.

The report describes diversionary ground modes of transportation that compete with air transportation. Diversionary ground modes are defined to be those modal transport systems taken singly or in combination which provide intercity mobility for goods and people. Intercity mobility via competing ground modes vis-a-vis the air transportation network is the central focus here. In applying this definition to delineate the scope of the assessment of planned developments in diversionary ground mode systems, it is desirable to further distinguish between corridor and noncorridor intercity travel. Requirements for corridor transport systems (terminals, routes, schedules, environmental factors) are sufficiently different from those for noncorridor systems to require their separate consideration.

PB-216 187/5 PC$3.00/MF$0.95
Booz-Allen Applied Research, Inc., Bethesda, Md.
SYSTEM SELECTION STUDY TECHNOLOGY ASSESSMENT TASK (TASK 350).
26 May 72, 79p*
Errata sheets inserted.

Descriptors: (*Air transportation, Requirements), Predictions, Urban planning, Urban transportation, Passenger transportation, Cargo transportation, Air pollution, Aircraft noise, Terminal facilities, Transportation management, Air traffic control, Fuel consumption, Scheduling.
Identifiers: Airport access systems.

The report suggests some technological change requirements needed to alleviate the impact of anticipated increases in air transportation in the United States to the beginning of the twenty first century.

PB-216 189/1 PC$3.00/MF$0.95
Booz-Allen Applied Research, Inc., Bethesda, Md.
SYSTEM SELECTION STUDY SYSTEMS DEFINITION TASK (TASK 340).
17 May 72, 255p*
Contract CON-AAC-72-07

Descriptors: (*Air Transportation, Requirements), Predictions, Urban planning, Urban transportation, Passenger transportation, Cargo transportation, Air pollution, Aircraft noise, Terminal facilities, Transportation management, Air traffic control, Fuel consumption, Scheduling.
Identifiers: Airport access systems.

The report discusses projected air transportation problems and defines areas of demand, capacity, and performance requirements. It also defines candidate systems and operational concepts, their environmental impact, and anticipated costs and growth potential to the year 2000.

PB-216 252/7 PC$6.00/MF$0.95
Simat, Helliesen and Eichner, Inc., Washington, D.C.
FORECAST OF AIR TRAFFIC DEMAND AND ACTIVITY LEVELS TO THE YEAR 2000,
Nathan Simat, and Kenneth Carlson. 27 Mar 72, 347p*
Contract CON-AAC-71-04
Revision of report dated 15 Nov 71.

Descriptors: (*Air traffic, Forecasting), (*Air transportation, Forecasting), Air cargo, General aviation aircraft, Civil aviation, Planning, Military transportation, Population growth.
Identifiers: General aviation.

The report contains a projection of unconstrained passenger enplanements and departures of a conventional system by geographic area, presented as follows: Summary and highlights; Critical planning assumptions; Air passenger forecasts; Air cargo forecasts; General aviation and military forecasts.

PB-216 400/2 PC$3.00/MF$0.95
Aviation Advisory Commission, Washington, D.C.
GENERAL AVIATION.
11 May 72, 21p

Descriptors: (*Civil aviation, Government policies), National government, Air transportation, Aviation safety, Benefit cost analysis.
Identifiers: *General aviation.

General aviation makes up a large and important segment of the total national transportation system. Business and personal air transportation today carry substantial and significant numbers of passengers to and from the thousands of points too small to support scheduled air service. It should be national policy to develop general aviation (business and personal transportation plus special uses) in all of its useful functions. The government should recognize the essentiality of general aviation and lend such assistance as is necessary for the fulfillment of its contribution to national transportation goals. (Author)

PB-217 115/5 PC$3.00/MF$0.95
National Transportation Safety Board, Washington, D.C.
ACCIDENTS INVOLVING ENGINE FAILURE/MALFUNCTION, U.S. GENERAL AVIATION, 1965-1969.
Special study.
29 Nov 72, 209p NTSB-AAS-72-10

Descriptors: (*Aviation accidents, Statistical analysis), (*Civil aviation, *Accident investigations), (*Aircraft engines, Failure), Collision research, Pilots, Performance evaluation, Maintenance, Inspection, Fuel consumption, Depletion.

The report presents the record of engine failure/malfunction accidents for fixed-wing aircraft which occurred in all operations of U.S. General Aviation during the period 1965-1969. It includes a comparison of the engine-failure accident rates for single-engine and multiengine aircraft. Analyses are included concerning causes and related factors of engine-failure accidents by selected makes and models of aircraft and engines. Injury tables, analytic tables, and cause/factor tables are presented for all fixed-wing aircraft along with single-engine and multiengine fixed-wing aircraft. (Author)

1C. Aircraft

AD-757 143 PC$3.00/MF$0.95
Army Electronics Command Fort Monmouth N J
AIRFRAME EXCITATION OF THE LOH-6A HELICOPTER AT HF (2 - 30 MHZ).
Technical rept.,
Charles M. DeSantis. Feb 73, 54p Rept no. ECOM-4077

Descriptors: (*Airframes, Vibration), (*Aircraft antennas, Excitation), (*Helicopters, *Airframes), Electromagnetic fields, Electrical impedance, Resistance (Electrical), Antenna radiation patterns, Airplane models, Test methods.
Identifiers: H-6 aircraft, LOH-6A aircraft, Magnetic excitation.

The report describes the results of a four-month investigation of the controlled airframe excitation of helicopters in the 2 - 30 MHz frequency range. Two methods of excitation are considered: magnetic and electric. Magnetic excitation is achieved by using a pair of coils placed symmetrically on the tail section of the aircraft to induce longitudinal currents in the aircraft skin. Electric excitation is achieved by covering the rear section of the aircraft with a metallic sleeve to create a high impedance gap which can be driven with a voltage source. Measurements of the impedance, radiation patterns, bandwidth, and efficiency were made on a 5:1 scale model of the LOH-6A helicopter in the frequency range 10 - 150 MHz. (Author)

AD-757 167 PC$4.50/MF$0.95
Rochester Applied Science Associates Inc N Y
DETERMINATION OF THE AERODYNAMIC CHARACTERISTICS OF VORTEX SHEDDING FROM LIFTING AIRFOILS FOR APPLICATION TO THE ANALYSIS OF HELICOPTER NOISE.
Final rept. 18 Jun 69-31 Jan 73,
S. Gene Sadler, H. Kevin Johnson, and Timothy D. Evans. Feb 73, 75p* Rept no. RASA-73-02
AROD-8695:2-E
Contract DAH C04-69-C-0090

Descriptors: (*Rotor blades (Rotary wings), *Aerodynamic noise), Blade airfoils, Aerodynamic characteristics, Airplane noise, Power spectra, Probability density functions, Acoustics.
Identifiers: Vortex shedding.

A study of vortex shedding from a lifting airfoil has been carried out. The objective of the study was to determine the important parameters affecting vortex shedding from airfoils for application to the study of vortex noise in helicopters. The study was conducted in the UARL acoustic research wind tunnel. Measurements of far-field noise and surface pressure fluctuations were obtained and analyzed for a NACA 0012 airfoil. (Author Modified Abstract)

AD-757 257 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
THE NUMERICAL SOLUTION AND ANALYSIS OF AIRPLANE SPIN EQUATIONS MODELED IN A FIXED COORDINATE SYSTEM.
Master's thesis,
Robert Louis Champoux. Dec 72, 139p

Descriptors: (*Jet fighters, Spin), (*Aerodynamic loading, Numerical analysis), Mathematical models, Computer programs, Force (Mechanics), Equations of motion, Partial differential equations, Integration, Stability, Theses.
Identifiers: Computerized simulation, F-4 aircraft, F-111 aircraft, *Aircraft spin.

Three forms of the airplane spin equations of motion, derived by Buehler form the basis for the development of a computer program designed to seek dynamically stable equilibrium solutions of a spinning aircraft. The program incorporates two solution techniques: one based upon Euler integration, the other, a version of minimization by gradient search. Secondary programs are developed to generate power off glide parameters for use in the validation of the equations of motion, and evaluate equation residuals obtained from a grid of initial conditions over the potential solution space. F-111 and F-4 aerodynamic force and moment models were utilized to evaluate the solution methods and equations of motion. The numerical results indicate that the F-111 and F-4 data are not representative of the actual aircraft and, therefore, it is highly unlikely that dynamically stable equilibrium solutions can be achieved from these models. (Author Modified Abstract)

AD-757 264 PC$5.45/MF$0.95
United Aircraft Research Labs East Hartford Conn
LIFTING SURFACE THEORY FOR STATICALLY OPERATING PROPELLERS.
Final rept. May 71-Sep 72,
James C. Murray, and Franklin O. Carta. Dec 72, 123p* AFAPL-TR-72-100
Contract F33615-71-C-1430

Descriptors: (*Propellers (Aerial), Aerodynamic characteristics), Aerodynamic configurations, Wake, Flow fields, Vortices, Trailing edge, Mathematical models, Control sequences.
Identifiers: Lifting surfaces.

A method was derived and a computer program formulated which utilizes a vortex-lattice lifting surface representation to model a statically operating propeller and to compute its performance. The computer program has been written to yield propeller performance characteristics for a prescribed blade geometry (the direct problem) or to yield blade camber distribution (the indirect problem). All of the results described were obtained for the direct problem. Performance characteristics, including propeller thrust and torque coefficients, were computed for three propeller configurations and were compared with test data and with results computed using lifting line theory. (Author Modified Abstract)

AD-757 267 PC$3.00/MF$0.95
Advisory Group for Aerospace Research and Development Paris (France)
ADVANCED ROTORCRAFT. VOLUME I.
Conference proceedings.
Feb 73, 237p Rept no. AGARD-CP-121
Papers presented at the Meeting of the Flight Mechanics Panel of AGARD (39th), held at NASA Langley Research Center, Hampton, Virginia, U.S.A., on 20-23 September 1971. NATO furnished.

Descriptors: (*Helicopters, *Symposia), Rotor blades (Rotary wings), Helicopter rotors, Helicopter engines, Helicopter hoists, Performance (Engineering), Flight simulators, Advanced planning.

The objectives of this Symposium were to: review the experiences gained from existing helicopter operations, review the lessons obtained from flight tests of experimental helicopters, discuss the future of advanced rotorcraft, and to discuss improved ground test facilities for research and development of new rotorcraft. The Symposium brought together research scientists, designers,

flight test engineers and military personnel for an in-depth exchange of views on the past, present and future of rotorcraft. The papers presented at the Symposium are published in Volume I of the Proceedings. (Author)

AD-757 271 PC$6.00/MF$0.95
Lear Siegler Inc Santa Monica Calif Astronics Div
FEASIBILITY STUDY FOR AN ADVANCED DIGITAL FLIGHT CONTROL SYSTEM (DIGIFLIC). VOLUME I. SUMMARY, ANALYSIS, AND SYSTEM STUDIES. VOLUME II. SOFTWARE, SPECIFICATION, SIMULATION STUDIES, AND APPENDICES.
Final rept. Sep 71-Aug 72,
M. L. Sutton, W. J. Hasson, and G. M. Soderlund. Oct 72, 494p Rept no. ADR-773
Contract N62269-72-C-0142
Errata sheet inserted.

Descriptors: (*Flight control systems, Feasibility studies), (*Special purpose computers, Flight control systems), Jet fighters, Digital computers, Adaptive control systems, Automatic pilots, Mathematical models, Computer programs, Specifications.
Identifiers: Flight control computers, DIGIFLIC (Digital Flight Control Systems), Digital flight control systems, Control theory.

The digital flight control system (DIGIFLIC) program is an advanced development program of which the principle objective was to study the feasibility of advanced flight control using a digital processor as the main computational element. The studies and analyses conducted during this program resulted in the determination of a set of basic system requirements which could be implemented using present day technology. Investigation of future technology showed that significant advances can be expected which will reduce the size, weight and power required for such a flight control system. The results of these studies are contained in two volumes. Volume 1 contains a detailed summary of the objectives and results, analytical studies and system studies. Volume 2 contains the software studies, system specification, simulation studies and appendices. (Author Modified Abstract)

AD-757 283 PC$3.00/MF$0.95
Cranfield Inst of Tech (England)
ANALYSIS OF TAXIING INDUCED VIBRATIONS IN AIRCRAFT BY THE POWER SPECTRAL DENSITY METHOD.
Final rept. May-Dec 71,
C. L. Kirk. Jan 73, 43p AFFDL-TR-72-74
Contract F44620-71-C-0084

Descriptors: (*Airframes, Fatigue (Mechanics)), (*Jet transport planes, *Vibration), (*Landing gear, Loading (Mechanics)), Taxiing, Runways, Surface roughness, Tires, Transfer functions, Tanker planes, Power spectra, Distribution functions, Mathematical models, Equations of motion, Computer programs, Great Britain.
Identifiers: C-135 aircraft, KC-135A aircraft, Three degrees of freedom, Degrees of freedom, Dynamic response, Spectral energy distribution.

Taxiing induced vibrations in large aircraft due to runway and taxiway unevenness have been recognized as a significant factor in causing airframe metal fatigue damage and dynamic stressing, as well as discomfort for the crew and passengers. Vibration of the landing gear also causes seal wear with subsequent leakage of air and hydraulic fluid. The report presents an analytical method of determining the random vibration response of a flexible aircraft caused by runway unevenness transmitted through the main landing gear struts. The aircraft used in the computation of vibration response is the Boeing KC-135A (Stratotanker) in the fully loaded configuration (324,000 lb) (146,963 kg).

AD-757 583 PC$3.00/MF$0.95
Rand Corp Santa Monica Calif
CONFIDENCE IN ESTIMATED AIRFRAME COSTS: UNCERTAINTY ASSESSMENT IN AGGREGATE PREDICTIONS,
F. S. Timson, and D. P. Tihansky. Oct 72, 91p Rept no. R-903-PR
Contract F44620-73-C-0011

Descriptors: (*Airframes, *Costs), (*Regression analysis, Uncertainty), Correlation techniques, Mathematical prediction, Programming (Computers), Graphics, Mathematical models.
Identifiers: *Cost estimates, Cost analysis.

The study develops and applies a method for quantitative analysis of the uncertainty inherent in certain predictive models involving a number of regression equations. Specifically, it analyzes the uncertainty associated with the Rand airframe cost estimating model.

AD-757 510 PC$3.00/MF$0.95
United Aircraft Research Labs East Hartford Conn
NONDESTRUCTIVE HOLOGRAPHIC TECHNIQUES FOR STRUCTURES INSPECTION.
Annual technical rept. 1 Jul 71-30 Apr 72,
R. K. Erf, J. P. Waters, R. M. Gagosz, F. Michael, and G. Whitney. Oct 72, 138p* Rept no. L991208-12 AFML-TR-72-204
Contract F33615-71-C-1874

Descriptors: (*Airframes, Non-destructive testing), (*Non-destructive testing, *Stereoscopic photography), Lasers, Strain (Mechanics), Surface properties, Compressor blades, Feasibility studies, Composite materials, Vibration.
Identifiers: *Holography, Ruby lasers, Interferometric holography.

The program is investigating the feasibility of using holographic interferometry for the inspection of large aircraft structures in a manufacturing or maintenance environment. The work comprised the following: 1 - An investigation of various problems to be encountered in technically difficult physical environments as a result of ambient lighting, vibration and suspended aerosols. 2 - An evaluation of the effects that various surface finishes have on the holographic construction process. 3 - The development of the theory required to relate holographic records to the strain patterns and areas of maximum strain present on large structures. 4 - Successful application of both continuous-wave (cw) and pulsed laser systems to time-averaged interferometric holography of composite compressor blades subjected to ultrasonic stressing. (Author Modified Abstract)

AD-757 529 PC$3.00/MF$0.95
Boeing Commercial Airplane Co Seattle Wash
EXPLORATORY DEVELOPMENT ON APPLICATION OF RELIABILITY ANALYSIS TO AIRCRAFT STRUCTURES CONSIDERING INTERACTION OF CUMULATIVE FATIGUE DAMAGE AND ULTRAMATE STRENGTH.
Final rept. 16 Nov 70-15 Mar 72,
I. C. Whittaker, and S. C. Saunders. Jan 73, 51p Rept no. D6-60165 AFML-TR-72-283
Contract F33615-71-C-1134

Descriptors: (*Airframes, Fatigue (Mechanics)), Cracks, Crack propagation, Fracture (Mechanics), Gust loads, Numerical analysis, Reliability, Random variables.
Identifiers: Reliability analysis.

An analysis method for determining the reliability of airplane structures, subjected to the cumulative and maximum operational loads and the resultant interaction of fatigue damage and strength, has been investigated. The design variables include the central tendency values of the fatigue performance, that is, the average lives to initiation and the growth of a major crack, and the effect of the crack on structural strength. Other variables include the standard operational procedure of periodic inspection of the structure and its repair when found to be damaged. Functions, based on the length of the fatigue crack, are used to describe both the residual strength of the structure and the probability of the crack being detected and the cracked structure being repaired. The times to initiation of a crack and the later time when the crack becomes critical, i.e., unstable, are taken as random variables. The derived reliability model considers that at any time the structure is either failed or unfailed. (Author Modified Abstract)

AD-757 537 PC$3.00/MF$0.95
Boeing Commercial Airplane Co Seattle Wash
AIRCRAFT HYDRAULIC SYSTEM DYNAMICS.
Final rept. June-Dec 72,
Alvin W. Waterman, Arun K. Trikha, and Kenneth D. Groom. Feb 73, 62p Rept no. D6-41108 AFAPL-TR-73-2
Contract F33615-72-C-1699

Descriptors: (*Aircraft, Hydraulic systems), (*Hydraulic systems, Mathematical models), Thermal analysis, Transients, Frequency, Programming (Computers), Digital computers, Pumps, Dynamics.
Identifiers: Computer aided analysis.

It is desirable to use computerized analysis techniques in place of costly ground testing and outmoded hand calculations as methods of analyzing aircraft hydraulic system dynamic performance. The current potential for accomplishing this objective was assessed to establish recommendations for future development. Criteria established as desirable features were the use of digital programming and building-block concepts in each of three technical areas (Transient Response, Frequency Response, and Thermal Analysis) needed to describe a composite of system performance. Basic development work was determined to be accomplished in all three technical areas, but in no area did these efforts meet the USAF objectives. Transient Response capability needs improvement to simulate frequency-dependent friction and cavitation characteristics. Frequency Response programming requires much improvement in the technique for analyzing pump/system interactions. Thermal Analysis steady-state analysis programming needs to be expanded to provide transient capability. These efforts are recommended to be accomplished in a coordinated 5-year program with continuous parallel effort being conducted in each of the three technical areas. These efforts involve evaluation of performance characteristics, development of programming subroutines, validation testing against typical aircraft system operational performance, and documentation of programming for general industry use. (Author)

AD-757 646 PC$3.00/MF$0.95
Naval Air Development Center Warminster Pa Air Vehicle Technology Dept
PROGRESS REPORT ON HIGH VOLTAGE DC AIRCRAFT SYSTEM DEVELOPMENT.
Progress rept.,
R. Howard Ireland. 23 Feb 73, 20p Rept no. NADC-73035-30

Descriptors: (*Aircraft equipment, *Power equipment), Direct current, Electrical equipment, Reliability (Electronics).

The report presents the advantages of a high voltage dc aircraft electrical system over conventional ac systems, discusses several conceptual distribution system designs, and summarizes the current status of the high voltage dc development program. (Author)

N73-15998 PC$3.00/MF$0.95
Massachusetts Inst. of Tech., Cambridge. Charles Stark Draper Lab.
SOME EFFECTS OF BIAS ERRORS IN REDUNDANT FLIGHT CONTROL SYSTEMS.
R. F. Stengel. Jun 72, 12p NASA-CR-130354, E-2688

Contract NAS9-10268

Descriptors: *Aircraft control, *Aircraft performance, *Flight control, *Redundant components, Error analysis, Mathematical models, Signal processing, Systems analysis.

For abstract, see STAR 11 07.

N73-16008 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Flight Research Center, Edwards, Calif.
MODELING OF AIRPLANE PERFORMANCE FROM FLIGHT-TEST RESULTS AND VALIDATION WITH AN F-104G AIRPLANE.
R. T. Marshall, and W. G. Schweikhard. Feb 73, 30p NASA-TN-D-7137, H-723

Descriptors: *Aerodynamic characteristics, *Aircraft performance, *Performance prediction, *Propulsion system performance, Aerodynamic coefficients, Mathematical models, Tables (data).

For abstract, see STAR 11 07.

N73-16010 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Flight Research Center, Edwards, Calif.
EXPLICIT DETERMINATION OF LATERAL--DIRECTIONAL STABILITY AND CONTROL DERIVATIVES BY SIMUTANEOUS TIME VECTOR ANALYSIS OF TWO MANEUVERS.
G. B. Gilyard. Feb 73, 12p NASA-TM-X-2722, H-751

Descriptors: *Aircraft performance, *Flight control, *Stability derivatives, *Vector analysis, Aerodynamic characteristics, Aircraft control, Control stability.

For abstract, see STAR 11 07.

N73-16015 PC$3.00/MF$0.95
Massachusetts Inst. of Tech., Cambridge. Aeroelastic and Structures Research Lab.
INVESTIGATION OF SOME PARAMETERS AFFECTING THE STABILITY OF A HINGELESS HELICOPTER BLADE IN HOVER.
P. Friedmann. Aug 72, 19p NASA-CR-114525, ASRL-TR-166-4
Contract NAS2-6175

Descriptors: *Equations of motion, *Helicopter performance, *Rigid rotors, *Rotary wings, *Stability derivatives, Aerodynamic characteristics, Aerodynamic configurations, Aeroelasticity.

For abstract, see STAR 11 07.

N73-16017 PC$3.75/MF$0.95
Messerschmitt-boelkow-blohm G.H.B.H., Hamburg (West Germany).
COMPARISON BETWEEN STOL AIRCRAFT WITH MECHANICAL HIGH-LIFT SYSTEMS AND STOL AIRCRAFT WITH BLOWN FLAP WINGS . STOL-FLUGZEUGE MIT MECHANISCHEN HOCHAUFTRIEBSYSTEMEN IM VERGLEICH ZU STOL--FLUGZEUGEN MIT BLASKLAPPEN-FLUEGELN.
E. Bielefeldt. 20 Sep 72, 35p MBB-UH-12-72-O, DGLR-PAPER-72-057
Conf- Presented At the 5th Dglr Ann. Meeting, Berlin, 4-6 Oct. 1972
Language German

Descriptors: *Externally blown flaps, *Lift devices, *Short takeoff aircraft, *Wing flaps, Aerodynamic characteristics, Weight (mass).

For abstract, see STAR 11 07.

N73-16019 PC$10.00/MF$0.95
Dornier-werke G.M.B.H., Friedrichshafen (West Germany).

STUDY OF FLIGHT DYNAMICS . USING PROBLEM ORIENTED PROGRAM LANGUAGES . UNTERSUCHUNG DER FLUGZEUGDYNAMIK MIT HILFE BLOCKORIENTIERTER PROGRAMMIERSPRACHEN.
H. Friedrich, H. Munser, and W. Kohl. 1972, 159p BMVG-FBWT-72-21
Subm- Sponsored By Bundesmin. Fuer Verteidigung

Descriptors: *Aircraft stability, *Digital simulation, *Flight mechanics, *Programming languages, Computer programming, Do-31 aircraft, Dynamic tests, G-91 aircraft, Perturbation theory.

For abstract, see STAR 11 07.

N73-16247 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Flight Research Center, Edwards, Calif.
DESIGN AND FLIGHT TESTING OF A NULLABLE COMPRESSOR FACE RAKE.
J. K. Holzman, and G. A. Payne. Jan 73, 17p NASA-TN-D-7162, H-733

Descriptors: *In-flight monitoring, *Jet aircraft, *Pressure sensors, *Reliability engineering, Equipment specifications, Operational problems.

For abstract, see STAR 11 07.

N73-16576 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
USE OF COMPOSITE MATERIALS IN AIRCRAFT STRUCTURES.
A. S. Volmir, V. F. Pavlenko, and A. T. Ponomarev. Jan 73, 17p NASA-TT-F-14648
Contract NASW-2483
Tran- Transl. Into English From Mekhan. Polimerov, Akad. Nauk Latv. Ssr (Riga), Jan. Feb. 1972 P 105-112

Descriptors: *Aircraft structures, *Damping tests, *Engine design, Boron compounds, Carbon fibers, Impact strength, Reinforcing fibers.

For abstract, see STAR 11 07.

N73-16905 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
EVALUATION OF AN AEROELASTIC MODEL TECHNIQUE FOR PREDICTING AIRPLANE BUFFET LOADS.
P. W. Hanson. Feb 73, 62p NASA-TN-D-7066, L-8460

Descriptors: *Buffeting, *Fighter aircraft, *Gust loads, *Variable sweep wings, *Wind tunnel models, Aerodynamic characteristics, Aircraft performance, Performance prediction.

For abstract, see STAR 11 07.

PB-215 619/8 PC$3.00/MF$0.95
Temple, Barker and Sloane, Inc., Wellesley Hills, Mass.
THE PROSPECTIVE ROLE OF COMPETITION IN CIVIL AVIATION,
Paul W. Cherington. 31 Jul 72, 32p AAC-SPI-71-2

Descriptors: (*Aerospace industry, *Return on investment), (*Civil aviation, Competition), International trade, Economic factors, Fixed price contract, Government procurement, Market research.
Identifiers: *Risk transfer, Balance of payments.

The report raises the possibility that because of increasing program costs and down-side risk, we may have seen the last U.S. medium and large transport. Given the competitive environment and particularly the rise of subsidized foreign competition, U.S. manufacturers may no longer be willing to commit to new multi-billion dollar programs for medium and large transports. This is especially true in light of the meager over-all profits thus far earned on commercial transport projects. Much the same thing applies to large jet engines which do not have a clear military application. The report discusses a variety of ways in which down-side risk of the developers and manufacturers could be transferred or reduced or alternatively or in addition profit prospects increased. (Author)

1D. Aircraft Flight Control and Instrumentation

AD-757 344 PC$3.00/MF$0.95
Sanders Associates Inc Nashua N H
TACTILE DISPLAY FOR AIRCRAFT CONTROL.
Semi-annual technical rept.,
Don H. Ross, Richard A. Sanneman, William H. Levison, Robert B. Tanner, and Thomas J. Triggs. Jan 73, 111p
Contract N00014-73-C-0031, ARPA Order-2108
Prepared in cooperation with Bolt Beranek and Newman, Inc., Cambridge, Mass. Behavioral Science Div.

Descriptors: (*Touch, Instrumentation), (*Pilots, *Man-machine systems), (*Instrument flight, *Flight control systems), Sensory mechanisms, Sensation (Physiology), Vibration, Electric currents, Logic circuits, Stimulation, Experimental data.
Identifiers: Tactile instrumentation, Tactors.

In current aircraft, nearly all the flight parameter information available to the pilot is transmitted to him visually, whether under visual contact or instrument flying conditions. It has long been recognized that during instrument flying conditions the task of scanning just the essential instruments is a taxing, fatiguing one. It may be that displays using information from other modalities can alleviate the demands of this task. Tactual presentations possess considerable promise of being suitable substitutes for visual displays in flight-control applications. The goal of this program is to develop tactual displays that can be utilized for flight control. (Author Modified Abstract)

AD-757 509 PC$3.00/MF$0.95
Aeronautical Systems Div Wright-Patterson AFB Ohio
ANALYSIS OF DOPPLER VELOCITY SENSOR PERFORMANCE IN PRECIPITATION.
Technical rept.,
David J. Krile. Jan 73, 80p Rept no. ASD-TR-72-78

Descriptors: (*Ground speed indicators, Reliability), (*Doppler effect, Attenuation), Microwaves, Reflection, Atmospheric precipitation, X band, Doppler radar, Flight testing.
Identifiers: Computerized simulation.

Airborne Doppler velocity sensors obtain measurements of aircraft groundspeed by observing Doppler frequency shifts in beams of microwave energy reflected from the earth. When hydrometeors exist between the aircraft and the earth, some of the received energy is a result of reflections from the hydrometeors. Computer simulations were performed to determine the amount of energy reflected from raindrops with pulsed, CW, and FM/CW Dopplers. Descriptions of the simulations and their results are presented herein. They indicate that significant amounts of energy are received from rain reflections even with moderate rain rates. (Author Modified Abstract)

1E. Air Facilities

AD-757 115 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss

TESTS ON SOILS SAMPLES FROM OVERSEAS AIR BASES.
Technical memo.
Apr 49, 42p Rept no. AEWES-TM-3-274

Descriptors: (*Runways, *Soil mechanics), Tests, Military facilities, Classification, Compressive properties, Foundations (Structures), Plasticity, Loading (Mechanics), Particle size, Moisture, Italy, Burma, China, Philippines, Alaska.
Identifiers: Soil stabilization, Bearing strength, Flexible pavements.

The project consists of the performance of mechanical analyses, Atterberg limits, specific gravity, Proctor compaction, and California Bearing Ratio tests on each soil sample received from overseas air bases. A total of 551 samples from 222 overseas air bases were received, identified, and tested. Results are discussed. Airfields from Italy, Africa, India, Burma, China, Philippines, and Alaska are included in the tests.

AD-757 136 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
CONDITION SURVEY, MICHAEL ARMY AIRFIELD DUGWAY PROVING GROUND, DUGWAY, UTAH.
Mar 68, 15p Rept no. AEWES-Misc-Paper-4-976

Descriptors: (*Military facilities, *Runways), (*Pavements, Structural properties), Performance (Engineering), Visual inspection, Failure (Mechanics), Defects (Materials), Cracks, Foundations (Structures), Concrete, Statistical data, Utah.
Identifiers: Michael Army Airfield, Dugway (Utah), Flexible pavements.

The purpose of this report is to present the results of an inspection performed at Michael Army Airfield (AAF) in April 1967. The inspection was limited to visual observations as no tests were conducted on the existing runways and taxiways. A layout of the airfield is shown.

AD-757 171 PC$3.75/MF$0.95
Federal Aviation Administration Washington D C Office of Systems Engineering Management
ENGINEERING AND DEVELOPMENT PROGRAM PLAN - AIRPORT PAVEMENT.
Oct 72, 42p* Rept no. FAA-ED-08-2

Descriptors: (*Pavements, Design), (*Airports, *Runways), Construction, Construction materials, Concrete, Reinforcing materials, Surface roughness, Non-destructive testing, Quality control.
Identifiers: Design criteria, Evaluation.

The Systems Research and Development Service of the FAA is conducting a research program for upgrading airport pavement technology by a coordinated contractor/in-house/industry effort. Three areas of action are design criteria, materials and construction, and test and evaluation. By the end of CY 1973 most of the current design, field test and evaluation efforts based on existing design technology will be completed and results of the study will be handed off to Airports Service for implementation by the regional authorities. To a great extent this information will supplement our existing technology which was derived from extrapolation of military and highway flexible and rigid pavement designs and post-World War 2 experience. (Author Modified Abstract)

AD-757 208 PC$3.00/MF$0.95
Army Construction Engineering Research Lab Champaign Ill
INSPECTION OF PAVEMENT GROOVING.
Technical rept. Dec 71-Jan 72,
Robert C. Gunkel. Feb 73, 50p AFWL-TR-72-149

Descriptors: (*Skidding, Control), (*Pavements, Skidding), (*Landing fields, Pavements), Surface roughness, Airports, Maintenance, Deterioration, Visual inspection.
Identifiers: Cement finishing, *Pavement grooving, Asphaltic concrete.

A reinspection of grooved pavements at four commercial and one military airfield was conduced by the Construction Engineering Research Laboratory (CERL) in December 1971 and January 1972. The inspection included grooving in both portland cement concrete (PCC) asphaltic concrete (AC) pavements which had been grooved approximately 4 1/2 years prior to this inspection. Grooves in all PCC pavements were considered to be in excellent condition with no evidence of deterioration on the pavement surface. At one airfield, Kansas City Municipal, numerous surface voids were noted which were due mainly to weathering out of poor quality materials. Many of these surface defects apparently were present at the time of grooving; however, it was apparent that some of the surface defects had developed recently. (Author Modified Abstract)

AD-757 383 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
EVALUATION OF MODIFICATIONS OF AM2 AND XM18 LANDING MAT,
C. D. Burns, and D. P. Wolf. Feb 70, 56p Rept no. AEWES-Misc-Paper-S-70-5

Descriptors: (*Landing mats, Performance (Engineering)), Tactical air support, Aluminum alloys, Loading (Mechanics), Pressure, Trafficability, Failure (Mechanics), Soil mechanics, Test methods.

The investigation was conducted to evaluate the performance of Alcoa AM2 and electron beam welded XM18 landing mat. The test section was subjected to traffic representing 1600 operational cycles of an aircraft having a 60,000-lb gross weight with a single-wheel main-gear assembly load of 27,000 lb and a 30x7.7 tire inflated to 400 psi. (Author Modified Abstract)

AD-757 384 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
EVALUATION OF ALCOA BRAZED AM5 LANDING MAT.
Final rept.,
Cecil D. Burns, and Denis P. Wolf. Nov 70, 35p Rept no. AEWES-Misc-Paper-S-70-26

Descriptors: (*Landing mats, Performance (Engineering)), Test methods, Aluminum alloys, Loading (Mechanics), Foundations (Structures), Failure (Mechanics), Visual inspection, Soil mechanics, Tactical air support, Deformation, Life expectancy.
Identifiers: Evaluation.

The investigation reported herein was conducted to evaluate the performance of Alcoa Lightweight Brazed AM5 landing mat. Fabrication included a new process called 'flip-flop brazing' by the manufacturer. A test section, consisting of a heavy clay subgrade, was constructed and surfaced with the Alcoa AM5 landing mat. The test section was subjected to traffic representing 1600 operational cycles (188 coverages) of an aircraft having a 60,000-lb gross weight with a single-wheel main gear assembly load of 27,000 lb and a 30x7.7 tire inflated to 400 psi, which represented the minimum service life requirement. (Author Modified Abstract)

AD-757 385 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
EVALUATION OF XM20 PRODUCTION LANDING MAT.
Final rept. Apr-May 69,
Cecil D. Burns, and Robert W. Grau. Feb 70, 44p Rept no. AEWES-Misc-Paper-S-70-6

Descriptors: (*Landing mats, Performance (Engineering)), Trafficability, Soil mechanics, Structural parts, Extrusion, Mechanical fasteners, Loading (Mechanics).
Identifiers: M-20 landing mats, XM-20 landing mats, Evaluation.

The report describes an investigation conducted to evaluate the performance of a production quantity of XM20 landing mat extruded by Dow Chemical Company, Madison Division, Madison, Ill., and fabricated by Washington Aluminum Company, Enterprise, Ala. The mat, fabricated from 2- by 12-ft extrusions, was similar to AM2 mat except for the method used to attach the end connectors to the main extrusion and a slight change of the cross section of the main extrusion. A test section consisting of one clay subgrade item at a strength of 4 CBR was constructed and surfaced with XM20 mat. The test section was subjected to uniform-coverage traffic representing operations of an aircraft having a 60,000-lb gross weight with a single-wheel main-gear assembly load of 27,000 lb with a 30x7.7 tire inflated to 400 psi. (Author Modified Abstract)

AD-757 387 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
CONDITION SURVEY, HUNTER ARMY AIRFIELD SAVANNAH, GEORGIA,
R. D. Jackson, and P. J. Vedros. Mar 72, 36p Rept no. AEWES-Misc-Paper-S-72-8

Descriptors: (*Military facilities, *Runways), (*Pavements, Visual inspection), Performance (Engineering), Cracks, Failure (Mechanics), Maintenance, Defects (Materials), Concrete, Bituminous coatings, Statistical data, Georgia.
Identifiers: Hunter Army Airfield, Savannah (Georgia), Flexible pavements.

The purpose of this report is to present the results of an inspection performed at Hunter Army Airfield (HAAF) in March 1971. The inspection was limited to visual observations, and no tests were conducted on any of the pavement facilities. A layout of the airfield is given. (Author Modified Abstract)

AD-757 417 PC$3.00/MF$0.95
Eustis Engineering Co Metairie La
ANALYSIS OF DATA: NON-DESTRUCTIVE DYNAMIC SOIL TESTS, FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA.
Engineering rept.,
J. Bres Eustis. 31 Jan 64, 91p
Contract DA-22-079-ENG-349

Descriptors: (*Runways, Non-destructive testing), (*Soil mechanics, Non-destructive testing), (*Pavements, Structural properties), Flexural strength, Foundations (Structures), Reinforced concrete, Cracks, Vibration, Elasticity, Compressive properties, Correlation techniques, South Dakota.
Identifiers: Foss Field, Sioux Falls (South Dakota), Flexible pavements.

Non-destructive dynamic tests were performed at Foss Field, Sioux Falls, South Dakota immediately prior to excavating test pits in a pavement evaluation study of the NE-SW runway and parallel taxiway at this site. These tests were performed in order to determine, if possible, the correlation between conventional and dynamic test data as well as to determine the relative strengths of the supporting subsoils by dynamic tests.

AD-757 628 PC$3.00/MF$0.95
Army Construction Engineering Research Lab Champaign Ill

ACTIVITY NETWORKS TO MODEL TRANSPORTATION SYSTEMS SUBJECT TO FACILITY CONSTRAINTS.
Technical manuscript,
Howard A. Porte, and W. W. Happ. Feb 73, 14p
Rept no. CERL-TM-A-6
Presented at the Annual Allerton Conference on Circuit and System Theory (9th), Monticello, Ill., 6-8 Oct 71.

Descriptors: (*Terminal flight facilities, Control systems), (*Air transportation, *Cargo), Queueing theory, Decision making, Transport planes, Handling, Logistics, Warehouses, Military facilities.
Identifiers: Computer aided analysis, Computerized simulation.

Cargo flow through an air cargo terminal is modeled as an activity network by utilizing: deterministic and probabilistic decision-making elements as nodes, activities or branches which relate the nodes and whose characteristics determine the magnitude and delay of commodity flow, and a set of statistical monitors to count events and to perform statistical evaluations at strategic points of the network. (Author)

AD-757 629 PC$3.00/MF$0.95
Army Construction Engineering Research Lab Champaign Ill
A STOCHASTIC NETWORK TO MODEL AIR CARGO TERMINALS.
Technical manscript,
Howard A. Porte, W. W. Happ, C. T. Lee, and L. P. McNamee. Feb 73, 20p Rept no. CERL-TM-A-7
Presented at the Army Science Conference, West Point, N. Y., 20-23 Jun 72.

Descriptors: (*Terminal flight facilities, Control systems), (*Air transportation, *Cargo), Queueing theory, Decision making, Transport planes, Handling, Logistics, Warehouses, Military facilities.
Identifiers: Computer aided analysis, Computerized simulation.

Bottlenecks of the material handling operation of an air cargo terminal are investigated by the stochastic network method of GERT IIIQ. The relationship of the GERTS IIIQ network model to construction specification is discussed. Operations bottlenecks are identified and corrected through modification of facility constraints. (Author Modified Abstract)

PB-216 434/1 PC$3.00/MF$0.95
Aviation Advisory Commission, Washington, D.C.
SURVEY OF MILITARY AIRFIELD AVAILABILITY FOR CIVIL USE.
Rept. for Apr 71-Mar 72.
Mar 72, 21p

Descriptors: (*Military air facilities, Availability), (*Civil aviation, Military air facilities), Feasibility.

In view of environmental considerations, competitive land use requirements and the high cost of land and airfield construction, the most practical solution for partially satisfying the future requirement for airports would be for joint use of military airfields. (Author)

2. AGRICULTURE

2B. Agricultural Economics

COM-73-10386 PC$3.00/MF$0.95
New Mexico Agricultural Experiment Station, University Park.
ALTERNATIVE FARM ORGANIZATIONAL STRUCTURES FOR THE NAVAJO INDIAN IRRIGATION PROJECT. PROJECTED CROPPING PATTERNS, LIVESTOCK ENTERPRISES, PROCESSING ACTIVITIES, CAPITAL REQUIREMENTS, EMPLOYMENT, INCOME, AND TRAINING NE EDS.
Special rept.,
Apr 72, 220p SR-17 FCRC-TA-301-300-014-17

Descriptors: (*Farm crops, Irrigated land), (*Agricultural economics, New Mexico), Employment, Fruits, Vegetables, Livestock, Investments, Capital, Economic conditions, Marketing, Education.
Identifiers: Navajo Indian irrigation project.

The Navajo Indian Irrigation Project was authorized by Congress in 1962 with the granting of a water diversion right of 508,000 acre-feet to bring into production 110,630 acres of land in northwestern New Mexico. The first 10,000 acres of land are expected to have water and be ready for farming in 1975. The objectives of this study were to (1) identify agricultural crops which can be economically produced in the Project area, (2) specify those crops which appear to have the greatest profit potential, (3) determine types of livestock which appear to be economically feasible, (4) specify and evaluate alternative farm organizational structures, (5) determine the amount of investment and operating capital required to adequately develop the Project, and (6) identify the number of personnel and the associated technical akills required to develop and operate the Project. (Author)

2C. Agricultural Engineering

COM-73-10384 PC$3.00/MF$0.95
Schick International, Morgan, Utah.
DEVELOPING A STATE WATER PLAN - AGRICULTURAL RECONNAISSANCE SUPPLEMENT TO THE MILL CREEK DEVELOPMENT PROJECT.
Summary rept.
Sep 71, 198p FCRC-TA-411-399-022

Descriptors: (*Water resources, *Utah), (*Water supply, Irrigation), Agriculture, Farm crops, Agricultural economics, Livestock, Economic development, Regional planning, Land use, Water rights, Water consumption, Industries, Mining, Rivers.
Identifiers: Mill Creek, Grand County (Utah), San Juan County (Utah).

Southeastern Utah's residents have always been faced with a scarity of water and the continual threat of flooding. The purpose of the report is to explore the possibility of developing a project in the vicinity of Moab, Utah, that could provide water for irrigation, M and I, and recreation uses in conjunction with flood control benefits. (Author)

COM-73-10385 PC$3.00/MF$0.95
Rollins, Brown and Gunnell, Inc., Provo, Utah.
DEVELOPING A STATE WATER PLAN - MUDDY CREEK DAM AND RESERVOIR, EMERY COUNTY, FEASIBILITY STUDY.
Aug 71, 59p FCRC-TA-401-505-063

Descriptors: (*Water resources, *Utah), (*Dams, Construction), Feasibility, Irrigation, Water supply, Agriculture, Farm crops, Reservoirs, Land use, Water rights, Water consumption.
Identifiers: *Emery County (Utah), Muddy Creek.

The report is primarily related to the physical feasibility of constructing a dam and reservoir on Muddy Creek to be used to store water for irrigation of 8.066 acres of land on 67 farms. (Author)

N73-16064 PC$3.75/MF$0.95
National Aeronautics and Space Administration, Washington, D.C.
RESULTS OF THE 1971 CORN BLIGHT WATCH EXPERIMENT.
R. B. Macdonald, R. D. Allen, M. E. Bauer, J. W. Clifton, and J. D. Frickson. 1972, 34p
NASA-TM-X-69055, LARS-PRINT-100272
Contract NGL-15-005-112
Subm- Prepared in Cooperation With Purdue Univ., Lab. for Applications of Remote Sensing

Descriptors: *Blight, *Corn, *Crop vigor, *Multispectral photography, *Remote sensors, Aerial reconnaissance, Agriculture, Data acquisition, Earth resources, Imaging techniques, Multispectral band scanners, Photointerpretation, Rust fungi.

For abstract, see STAR 11 07.

PB-215 417/7 PC-GPO/MF$0.95-NTIS
California State Dept. of Water Resources, Fresno. San Joaquin District.
REMOVAL OF NITROGEN FROM TILE DRAINAGE, BIO-ENGINEERING ASPECTS OF AGRICULTURAL DRAINAGE SAN JOAQUIN VALLEY, CALIFORNIA.
Summary rept.,
Randall L. Brown. May 71, 40p DWR-174-9
REC-R2-71-6, EPA-13030-ELY-5/71-6
Contract DI-14-06-200-3389A

Descriptors: (*Irrigation, *Water pollution), (*Chemical removal (Water treatment), *Nitrogen), (*Tile drains, Chemical removal (Water treatment)), Cost estimates, Algae, Nitrogen fixation, Electrodialysis, Harvesting, Coagulation, Desalting, Bacteria, Lagoons (Ponds), Dewatering, Performance evaluation, Methyl alcohol, Vacuum filtration.
Identifiers: Return flow, *Denitrification, *Water pollution control, Reverse osmosis, Anaerobic lagoons, Scenedesmus.

Studies have shown that it is technically feasible to reduce 20 mg/l nitrate-nitrogen in agricultural tile drainage to 2-5 mg/l by either algae stripping or bacterial denitrification. Conditions necessary for maximum algal growth included 8- to 12-inch pond depth, addition of small amounts of nutrients (CO_2, Fe, and P), up to four hours of daily mixing and detention times of from 5 to 16 days, depending on the season. The algae were harvested by coagulation-sedimentation followed by vacuum filtration. Bacterial denitrification was tested in anaerobic deep ponds and filters using methanol as a carbon source. Required detention times were on the order of 8 to 50 days for covered ponds (uncovered ponds were not suitable) and 1 to 2 hours for filters. Preliminary cost estimates are given. Laboratory studies indicated that nitrogen removal effectively lowered the biostimulatory nature of the waste with respect to algal growth in potential receiving waters. Two desalination processes were also studied -- electrodialysis and reverse osmosis. (Author Modified Abstract)

PB-216 552/0 PC$3.00/MF$0.95
California State Dept. of Water Resources, Fresno. San Joaquin District.
NUTRIENTS FROM TILE DRAINAGE SYSTEMS,
Water pollution control research series,
Lawrence R. Glandon. May 71, 104p DWR-174-6
REC-R2-71-9, EPA-13030-ELY-5/71-3
Report on Bio-Engineering Aspects of Agricultural Drainage - San Joaquin Valley, Calif.

Descriptors: (*Tile drains, *Water pollution), (*Subsurface drainage, *Nutrients), (*San Joaquin Valley, Water pollution), Irrigation, Agricullural wastes, Inorganic phosphates, Concentration (Composition), California, Design, Soil analysis, Periodic variations, Geomorphology, Fertilizers, Fertilizing, Water table.
Identifiers: Dissolved solids, *Return flow.

Tile drainage systems of the San Joaquin Valley were monitored for nutrients (nitrogen and

phosphorus) to determine the algal growth potential (AGP) of the waste, and the degree of treatment required for removal of AGP. The objectives were to determine: (1) the average nutrient concentrations in tile drainage, (2) the magnitudes of annual, areal and seasonal variability of nutrients and discharges, (3) if a possible correlation exists between nutrients and agricultural practices, and (4) if existing soil conditions influence nutrient concentrations and flows. Average discharges and nutrient concentrations were calculated for different years, months and areas of interest (valley-wide, major tiled areas, physiographic positions and soils). (Author Modified Abstract)

2D. Agronomy and Horticulture

N73-16164 PC$3.00/MF$0.95
Purdue Univ., Lafayette, Ind. Lab. for Applications for Remote Sensing.
DATA HANDLING AND ANALYSIS FOR THE 1971 CORN BLIGHT WATCH EXPERIMENT.
P. E. Anuta, and T. L. Phillips. 1973, 16p
NASA-CR-130368, LARS-PRINT-080172
Contract NGL-15-005-112

Descriptors: *Blight, *Corn, *Data processing, *Data systems, *Remote sensors, Multispectral band scanners, Pattern recognition.

For abstract, see STAR 11 07.

N73-16302 PC$3.00/MF$0.95
Purdue Univ., Lafayette, Ind.
IDENTIFICATION OF CROP SPECIES BY COMPUTER PROCESSING OF ERTS-1 MSS DATA.
31 Jan 73, 2p

Descriptors: *Crop identification, *Illinois, *Imagery, *Multispectral photography, Algorithms, Data processing, Earth resources program.

For abstract, see STAR 11 07.

N73-16421 PC$3.75/MF$0.95
Purdue Univ., Lafayette, Ind. Lab. for Applications of Remote Sensing.
DETERMINING DENSITY OF MAIZE CANOPY. 3 TEMPORAL CONSIDERATIONS.
E. R. Stoner, M. F. Baumgardner, P. E. Anuta, and J. E. Cipra. 1972, 33p NASA-CR-130369, LARS-PRINT-111372
Contract NGL-15-005-112

Descriptors: *Aerial photography, *Grains (food), *Multispectral band scanners, *Remote sensors, *Time dependence, Earth resources, Ground truth, Spectrum analysis.

For abstract, see STAR 11 07.

N73-16422 MF$0.95
Purdue Univ., Lafayette, Ind. Lab. for Applications of Remote Sensing.
DETERMINING DENSITY OF MAIZE CANOPY. 1 DIGITIZED PHOTOGRAPHY.
E. R. Stoner, M. F. Baumgardner, and P. H. Swain. 1972, 26p NASA-CR-130370, LARS-PRINT-111172
Contract NGL-15-005-112

Descriptors: *Color photography, *Grains (food), *Infrared photography, *Reflected waves, *Remote sensors, Density distribution, Digital data, Earth resources, Microdensitometers.

For abstract, see STAR 11 07.

N73-16425 PC$3.00/MF$0.95
Purdue Univ., Lafayette, Ind. Lab. for Applications of Remote Sensing.
DETERMINING DENSITY OF MAIZE CANOPY. 2 AIRBORNE MULTISPECTRAL SCANNER DATA.
E. R. Stoner, M. F. Baumgardner, and J. E. Cipra. 1971, 17p NASA-CR-130363, LARS-PRINT-111272
Contract NGL-15-005-112

Descriptors: *Aerial photography, *Grains (food), *Multispectral band scanners, *Remote sensors, Density measurement, Earth resources, Ground truth.

For abstract, see STAR 11 07.

N73-16428 PC$3.00/MF$0.95
Purdue Univ., Lafayette, Ind. Lab. for Applications of Remote Sensing.
INFLUENCE OF HAZE LAYERS UPON REMOTELY-SENSED SURFACE PROPERTIES.
G. M. Jurica, and W. L. Murray. 1972, 8p
NASA-CR-130028, LARS-PRINT-060272
Contract NGL-15-005-112
Conf- Presented At Conf. on Atmospheric Radiation, Fort Collins, Colo., 7-9 Aug. 1972

Descriptors: *Aerial photography, *Blight, *Corn, *Error analysis, *Remote sensors, Atmospheric scattering, Atmospheric stratification, Earth resources, Haze, Photointerpretation.

For abstract, see STAR 11 07.

N73-16489 PC$3.50/MF$0.95
Purdue Univ., Lafayette, Ind. Lab. for Applications of Remote Sensing.
MINIMUM DISTANCE CLASSIFICATION IN REMOTE SENSING.
A. G. Wacker, and D. A. Landgrebe. 9 Feb 72, 26p
NASA-CR-130030, LARS-PRINT-030772
Contract NGL-15-005-112
Conf- Presented At 1st Can. Symp. for Remote Sensing, Ottawa, 7-9 Feb. 1972

Descriptors: *Classifiers, *Crop identification, *Data sampling, *Performance, *Remote sensors, Distance measuring equipment, Earth resources.

For abstract, see STAR 11 07.

N73-16947 PC$3.00/MF$0.95
Purdue Univ., Lafayette, Ind. Lab. for Applications of Remote Sensing.
POTENTIAL BENEFITS OF REMOTE SENSING THEORETICAL FRAMEWORK AND EMPIRICAL ESTIMATE.
L. M. Eisgruber. 1972, 17p NASA-CR-130027, INFORM-NOTE-030872
Contract NGL-15-005-112

Descriptors: *Estimates, *Remote sensors, *Social factors, *Technology assessment, Cost estimates, Crop growth, Farm crops.

For abstract, see STAR 11 07.

TT-70-56088/10 PC$3.00/MF$0.95
Department of Agriculture, Washington, D.C.
CONTEMPORARY AGRICULTURE. VOLUME 19, NUMBER 10, 1971, BY SLAVKO BOROJEVIC.
1972, 101p
Trans. of Sevremena Poljoprivreda (Yugoslavia) v19 n10 p 3-82 1971, by Mihailo Markovic. The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Agriculture, Research), Agronomy, Wheat, Sugar beets, Sheep, Heredity, Cattle, Swine, Herbicides, Seeds, Proteins, Nutrition, Translations, Yugoslavia.
Identifiers: Sunflower meal.

Contents:

Effects of different rates and ratios of nitrogen, phosphorus and potassium on yield and quality of winter wheat Bezostaia 1;
Effects of time of mineral fertilization on yield and quality of sugar beet;
Effects of meliorator breeds on the inheritance of fleece density in crossbreeds of the F sub 1 generation;
Effects of crossbreeding Friesian and Red Dane Cattle on milking capacity in the first lactation;
A study of the corformation of Montafon cows on the Svetlost cooperative farm at Porodin near Bitolj;
On some microorganism species in feeding fattening pigs;
Effects of CDAA and CIPS herbicides on the content of Amino-acids in pea seed;
Physical properties, chemical composition and nutritional value of sunflower meal of high protein content;
Reviews.

2E. Animal Husbandry

AD-757 126 Reprint
Armed Forces Inst of Pathology Washington D C
ACANTHAMOEBIASIS IN A DOG,
K. M. Ayers, L. H. Billups, and F. M. Garner. 1972, 6p
Availability: Pub, in Veterinary Pathology, v9 p221-226 1972.

Descriptors: (*Parasitic diseases, Protozoa), (*Protozoa, Dogs), (*Dogs, Parasitic diseases), Veterinary medicine, Pathology, Infectious diseases, Histology.
Identifiers: *Acanthamoebiasis, Protozoal diseases.

Acanthamoeba infection occurred in a 4-year-old military working dog (German shepherd). The disease was manifested by multifocal necrohemorrhagic foci in the heart, lungs, liver, and pancreas. Numerous organisms morphologically compatible with Acanthamoeba sp. were seen in the lesions. The infection may have been caused by local invasion of a wound and hematogenous spread, via the respiratory tract, by inhalation of the organisms, or by direct extension of an inapparent nasal infection. (Author)

2F. Forestry

AD-757 388 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
A SYSTEM FOR MEASURING TREE OR STAND PRODUCTIVITY FOR USE IN THE MANAGEMENT OF FOREST LANDS,
Hollis H. Allen, and Harold W. West. Oct 72, 23p* Rept no. AEWES-Misc-Paper-M-72-7

Descriptors: (*Trees, Measurement), (*Forestry, Management planning), Triangulation, Theodolites, Lasers, Altitude, Volume, Wood, Growth, Production, Fertilizers, Optical instruments, Non-destructive testing.
Identifiers: Forest trees, Dimensions.

The U. S. Army Engineer Waterways Experiment Station has developed and evaluated a nondestructive system for describing the three-dimensional geometry of trees and stands. Tree or stand productivity was determined by dimensioning (i.e. measuring) the trees (or stands) before the start of a growing season and again after the growing season was completed. A measure of productivity was established by calculating the change or increase in tree height, stem and branch diameters, and wood volumes for each tree. This system has demonstrated that significant changes changes wood volumesfor each tree. This system has demonstrated that significant changes in tree productivity during one season's growth can be detected between untreated stands and ones sub-

jected to fertilizer treatments, thus making it an invaluable tool for management of forest stands. (Author)

3. ASTRONOMY AND ASTROPHYSICS

3A. Astronomy

AD-757 237 PC$3.25/MF$0.95
Army Foreign Science and Technology Center Charlottesville Va
A MULTIPLE-ROD PYRAMID AS A CYCLIC SUSPENSION FOR A PARABOLIC RADIOTELESCOPE MIRROR (MNOGOSTERZHNEVAYA PIRAMIDA KAK TSIKLICHESKAYA SKHEMA PODVESKI PARABOLICHESKOGO ZERKALA RADIOTELELSKOPA),
P. D. Kalachev. 11 Jan 73, 22p Rept no. FSTC-HT-23-1469-72
Trans. of Voprosy Radioelektroniki (USSR) n11 p29-41 1969.

Descriptors: (*Radio telescopes, Suspension devices), Mirrors, Structural properties, Mechanical properties, USSR.
Identifiers: Translations.

A multiple-support suspension for a fully rotatable, parabolic radiotelescope mirror, providing it with high mechanical rigidity in any position in space, can be realized by various construction designs. The layout can be accomplished in the form of intermediate supporting construction, in a system of mutually parallel and perpendicular supporting elements having two axes of symmetry in the plan. The scheme can be a system of mutually parallel supporting elements. For example, a multiple support suspension design can be carried out in the form of a supporting rod pyramid (cyclical plan), two rod pyramids or in the form of a combination of rod pyramid and intermediate support construction. (Author)

JPRS-58304 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
CONICAL SECTION METHOD FOR DETERMINING THE GEOMETRIC CONFIGURATION OF A PLANET BY PHOTOGRAPHS TAKEN FROM SPACE,
Yu. G. Karpushin, S. V. Lebedev, and Yu. M. Neiman. 23 Feb 73, 11p
Trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Geodeziya i Aerofotosemka (USSR) n3 p53-60 1972.

Descriptors: (*Planets, Photogrammetry), Geometry, Configuration, Mathematical models, Approximation (Mathematics), USSR.

The report contains a procedure for determining the geometric configuration of a planet in the form of a mathematically convenient closed surface approximating the real physical surface of the planet under a defined condition. (Author)

N73-16819 PC$4.25/MF$0.95
Royal Greenwich Observatory, Herstmonceux (England).
THE APPLICATION OF OBJECTIVE GRATINGS TO FAINT STAR PHOTOMETRY.
G. A. Harding, R. S. Harbour, and K. P. Tritton. 1971, 42p BULL-172

Descriptors: *Astronomical photometry, *Gratings, *Star clusters, *Stellar spectra, Astronomical telescopes, Centaurus constellation, Color, Lens design, Optical filters.

For abstract, see STAR 11 07.

3B. Astrophysics

AD-757 064 PC$3.00/MF$0.95
California Univ Los Angeles Plasma Physics Group
MAGNETOSPHERES OF THE OUTER PLANETS,
C. F. Kennel. May 72, 50p Rept no. PPG-120
Contracts N00014-69-A-0200-4023, AT (04-3)-34
Sponsored in part by Grants NGL-05-007-190, NSF-GP-22817 and NGR-05-007-116.

Descriptors: (*Planetary atmospheres, Magnetosphere), Saturn (Planet), Uranus (Planet), Neptune (Planet), Mathematical prediction, Solar wind, Magnetic moments, Jupiter (Planet), Magnetohydrodynamics.

Scaling laws for possible outer planet magnetospheres are derived. These suggest that convection and its associated auroral effects will play a relatively smaller role than at Earth, and that there is a possibility that they could have significant radiation belts of energetic trapped particles. (Author)

AD-757 465 Reprint
Oslo Univ (Norway) Inst of Theoretical Astrophysics
HIGH-RESOLUTION OBSERVATIONS OF TYPE III SOLAR RADIO BURSTS,
Oystein Elgaroy, and Edvin Lyngstad. 28 Jun 71, 18p Rept no. Scientific-27 AFCRL-TR-73-0002
Contract F61052-67-C-0070
Availability: Pub. in Astronomy and Astrophysics, v16 p1-12 1972.

Descriptors: (*Solar disturbances, *Extraterrestrial radio waves), Astronomical data, Power spectra, Solar corona, Norway.
Identifiers: *Solar radio emission.

Solar radio bursts of spectral type III have been observed using high-resolution radio spectrographs operating in the frequency ranges 310-340 MHz and 145-175 MHz. Quantities of interest for the theory of the Type III phenomenon such as frequency drift velocity, duration, time profile, intensity, number of bursts in groups and time separation between successive bursts are determined. Since observations were made in two temperature at two heights and to detect the increase in source size with time.

AD-757 466 Reprint
Oslo Univ (Norway) Inst of Theoretical Astrophysics
HIGH DISPERSION SPECTROSCOPIC STUDY OF QUIESCENT PROMINENCES,
Oddbjorn Engvold, and W. Livingston. 4 May 71, 20p Rept no. Scientific-28 AFCRL-TR-73-0005
Contract F61052-67-C-0070
Prepared in cooperation with Kitt Peak National Observatory, Tucson, Ariz.
Availability: Pub. in Solar Physics, v20 p375-388 1971.

Descriptors: (*Solar flares, *Atomic spectroscopy), Resolution, Turbulence, Calcium, Ions, Norway.

The utility of very high dispersion spectra for the study of line profile and velocity structure in quiescent prominences is demonstrated by observations. The emission profiles for both the H-alpha and the K-line often show a central reversal (absorption). Emission structures in the K-line can be complex. Frequently this structure consists of a central, strong, rather narrow line, and an often displaced, weak feature of undefined profile appearing as 'fuzz'. It is suggested that this fuzz indicates an exchange of matter between the prominence and the corona. (Author)

AD-757 687 PC$3.00/MF$0.95
Owens Valley Radio Observatory Pasadena Calif
APERTURE SYNTHESIS OF INTERSTELLAR NEUTRAL HYDROGEN IN ABSORPTION. I. THE PERSEUS ARM FEATURE OF CASSIOPEIA A,
Eric W. Greisen. 1973, 42p Rept no. 1973-1
Contract N00014-67-A-0094-0019

Descriptors: (*Interstellar matter, Hydrogen), Mapping, Absorption spectrum, Extraterrestrial radio waves, Theses.
Identifiers: Cassiopeia A radio source, Perseus arm, Radio sources (Astronomy).

The Owens Valley Radio Observatory interferometer was used to carry out a program of aperture synthesis in the interstellar neutral hydrogen absorption line. Maps having resolutions of 0.2 km/s and about 1.3 arc minutes were produced using a novel Fourier inversion method. This paper is devoted to discussions of the observing and analyzing procedures and of the results for the Perseus arm feature in the spectrum of Cassiopeia A. (Author Modified Abstract)

AD-757 688 PC$3.00/MF$0.95
Owens Valley Radio Observatory Pasadena Calif
NEUTRAL HYDROGEN APERTURE SYNTHESIS MAPS OF IC2574 AND NGC 7640,
G. A. Seielstad, and M. C. H. Wright. 1973, 22p Rept no. 1973-5
Contract N00014-67-A-0094-0019

Descriptors: (*Galaxies, Hydrogen), Radio astronomy, Radio interferometers, Mapping.
Identifiers: IC 2574 galaxy, NGC 7640 galaxy.

Aperture synthesis observations with an angular resolution about 2 arc-min of two late-type galaxies have revealed HI distributions some 1.5 times larger than their photographic images. IC2574, classified as an irregular galaxy, has a well organized velocity field typical of a late spiral galaxy. The major HI concentrations do not correspond with the brightest optical features. A ridge of peculiar velocities of about 10 km/s in the region of the optical 'bar' may indicate streaming motions of gas along the bar. NGC7640 is an SBc galaxy at an inclination of 77 degrees. There is no evidence of any HI halo brighter than 100 degrees K km/s, although there is a suggestion of warping of the plane of the HI layer. (Author)

AD-757 689 PC$3.00/MF$0.95
Owens Valley Radio Observatory Pasadena Calif
CONCERNING ANOMALOUS FORMALDEHYDE HYPERFINE LINES IN THE DUST CLOUD L1436,
Richard M. Crutcher. 1973, 11p Rept no. 1973-6
Contract N00014-67-A-0094-0019

Descriptors: (*Interstellar matter, Formaldehyde), Extraterrestrial radio waves, Dust, Line spectrum.

The authors show that there is no evidence of nonequilibrium hyperfine component intensities of formaldehyde in the dust cloud L1436. (Author)

AD-757 690 PC$3.00/MF$0.95
Owens Valley Radio Observatory Pasadena Calif
INTRODUCTION TO VERY-LONG-BASELINE INTERFEROMETRY,
M. H. Cohen. 1973, 30p Rept no. 1973-7
Contract N00014-67-A-0094-0019, Grant NSF-GP-30400
Sponsored in part by Grant NSF-GP-19400.

Descriptors: (*Radio astronomy, Experimental design), Radio telescopes, Radio interferometers, Calibration, Signal-to-noise ratio, Magnetic recording systems, Interstellar matter, Reviews.
Identifiers: Long baseline radio interferometers.

Long baseline interferometry achieves high angular resolution by using two (or more) widely

separated radio telescopes and recording video signals on magnetic tapes, which are later brought together and cross-correlated. This paper contains discussions of the coherence and timing requirements, and of calibration procedures. Applications to measuring brightness distributions and to spectroscopy are reviewed briefly. Some pertinent phenomena connected with radio wave scattering in irregular media are discussed. (Author)

E73-10346 PC$3.75/MF$0.95
Aerospace Corp., Los Angeles, Calif. Space Physics Lab.
REMOTE HAZE MONITORING BY SATELLITE: A STUDY TO DEMONSTRATE THE FEASIBILITY AND DETERMINE THE OPTIMUM METHOD.
Interim rept. May-Sep 72,
Ernest H. Rogers. Mar 73, 33p NASA-CR-130805
Contract NAS5-21719

Descriptors: Imagery, Haze detection, Computer programs, Southern California, Earth resources program, Air pollution, Data processing, Multispectral band scanners.

The author has identified the following significant results. A general purpose flexible computer program for the analysis of ERTS MSS data has been written for the Control Data 7600 computer. By putting all of the analysis operations into a separate subroutine the user may concentrate on the analysis. The problems of getting the information into the computer in convenient format is solved once and need not be tampered with each time a new analysis procedure is desired. The problems of getting information written by the XDS computers in 8 bit byte format into a convenient format for analysis on the 60 bit word format CDC 7600 computer are not trivial. A general purpose program to accomplish this has been written and is available from the investigators upon request.

N73-16491 PC$3.00/MF$0.95
Translation Consultants, Ltd., Arlington, Va.
ENERGY CALIBRATION OF THE ORION SPECTROGRAPH.
G. A. Gurzadyan, D. B. Oganesyan, and R. A. Yepremyan. Jan 73, 7p NASA-TT-F-14584
Contract NASW-2038
Tran- Transl. Into English From Soobshch. Byurakansk. Observ., Akad. Nauk Arm. Ssr (Erevan), No. 45, 1972 P 36-41

Descriptors: *Calibrating, *Energy bands, *Spectrographs, *Wavelengths, Dynamic response, Optical measurement, Stars.

For abstract, see STAR 11 07.

N73-16793 PC$5.75/MF$0.95
Lockheed Missiles and Space Co., Sunnyvale, Calif.
EXPERIMENTAL STUDY OF SPECTRAL AND SPATIAL DISTRIBUTION OF SOLAR X-RAYS.
Final Report
L. W. Acton, R. C. Catura, and J. L. Culhane. 29 Sep 72, 74p NASA-CR-130359, LMSC-D309802
Contract NASW-1834

Descriptors: *Aerobee rocket vehicle, *Line spectra, *Monochromators, *Solar spectrometers, *Solar x-rays, *X ray spectroscopy, Faculae, Neon, Oxygen, Rocket sounding, Solar corona, Solar flares.

For abstract, see STAR 11 07.

N73-16794 PC$4.25/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SPACE OBSERVATIONS OF THE VARIABILITY OF SOLAR IRRADIANCE IN THE NEAR AND FAR ULTRAVIOLET.
D. F. Heath. Dec 72, 45p NASA-TM-X-66143, X-651-72-458
Subm- Submitted for Publciation

Descriptors: *Solar constant, *Solar cycles, *Solar flares, *Solar radiation, *Ultraviolet spectrophotometers, Nimbus 3 satellite, Nimbus 4 satellite.

For abstract, see STAR 11 07.

N73-16795 PC$4.50/MF$0.95
Mcdonnell-douglas Astronautics Co., Huntington Beach, Calif. Space Sciences Dept.
MDAC SOLAR COSMIC RAY EXPERIMENT ON OGO-6.
Final Report, Mar. 1966 - Jan. 1973
A. J. Masley. Jan 73, 47p NASA-CR-130155, MDC-G4351
Contract NAS5-9324

Descriptors: *Ogo-f, *Radiation measurement, *Radiation measuring instruments, *Solar cosmic rays, Corpuscular radiation, Experimental design, Satellite observation, Satellite-borne instruments, Tables (data).

For abstract, see STAR 11 07.

N73-16796 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ON THE NATURE OF WEAK HIGH LATITUDE X-RAY SOURCES.
S. S. Holt, E. A. Boldt, P. J. Serlemitsos, and R. D. Bleach. Jan 73, 11p NASA-TM-X-66168, X-661-73-24

Descriptors: *Arctic regions, *Cosmic rays, *Radiation sources, *X rays, Extraterrestrial radiation, Luminosity, Statistical analysis.

For abstract, see STAR 11 07.

N73-16797 PC$3.50/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
NUCLEAR GAMMA RAYS FROM SOLAR FLARES.
R. Ramaty, and R. E. Lingenfelter. Jan 73, 29p NASA-TM-X-66165, X-660-73-14

Descriptors: *Gamma rays, *Line spectra, *Solar flares, Carbon, Charged particles, Excitation, Oxygen, Positron annihilation, Solar protons.

For abstract, see STAR 11 07.

N73-16798 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
NEUTRAL-PION-DECAY GAMMA RAYS FROM THE GALAXY AND THE INTERSTELLAR GAS CONTENT.
F. W. Stecker. Feb 73, 9p NASA-TM-X-66167, X-641-73-40
Subm- Submitted for Publication

Descriptors: *Cosmic rays, *Gamma rays, *Hydrogen, *Interstellar gas, Decay, Diatomic molecules, Milky way galaxy, Photons.

For abstract, see STAR 11 07.

N73-16799 PC$4.00/MF$0.95
Max-planck-institut Fuer Physik Und Astrophysik, Munich (West Germany).
ALFVEN WAVES IN THE SOLAR WIND WAVE PRESSURE POYNTING FLUX, AND ANGULAR MOMENTUM.
J. V. Hollweg. Jul 72, 39p
MPI-PAE/EXTRATERR-70

Descriptors: *Magnetohydrodynamic waves, *Solar wind, Angular momentum, Poynting theorem, Pressure effects, Wave propagation, Wentzel-kramer-brillouin method.

For abstract, see STAR 11 07.

N73-16810 PC$3.50/MF$0.95
California Univ., Santa Barbara. Dept. of Physics.
THE GRAVITATIONAL FIELDS OF THE MAJOR PLANETS.
S. J. Peale. Jun 72, 29p NASA-CR-130346
Contract NGR-05-010-062

Descriptors: *Mathematical models, *Planetary gravitation, *Tesseral harmonics, *Zonal harmonics, Grand tours, Gravitational fields, Natural satellites, Planetology.

For abstract, see STAR 11 07.

N73-16811 PC$4.75/MF$0.95
Smithsonian Astrophysical Observatory, Cambridge, Mass.
GAS ANALYSIS OF APOLLO 12, 14, AND 15 SAMPLES BY LASER-PROBE MASS SPECTROMETRY.
Final Report
G. H. Imegrue. 1972, 54p NASA-CR-130029, REPT-211-092
Contract NGR-09-015-144

Descriptors: *Cosmic rays, *Gas analysis, *Lunar rocks, *Mass spectrometers, *Radioactive isotopes, *Solar wind, Apollo 12 flight, Apollo 14 flight, Apollo 15 flight, Lunar soil, Radioactive age determination, Spallation.

For abstract, see STAR 11 07.

N73-16812 PC$6.25/MF$0.95
Missouri Univ., Rolla. Dept. of Chemistry.
NOBLE GASES IN THE MOON.
Annual Report
O. K. Manuel, B. Srinivasan, E. W. Hennecke, and D. E. Sinclair. Sep 72, 84p NASA-CR-130327
Contract NGR-26-003-057

Descriptors: *Isotopes, *Lunar soil, *Rare gases, Earth atmosphere, Meteorites, Spectrometers.

For abstract, see STAR 11 07.

N73-16813 PC$8.75/MF$0.95
TRW Systems Group, Redondo Beach, Calif.
STUDY OF IMPACT CRATERING IN LUNAR--LIKE MATERIALS.
Final Report
N. L. Roy, and J. C. Slattery. Jan 73, 131p NASA-CR-130356, TRW-17433-6002-RO-OO
Contract NASW-2311

Descriptors: *Lunar soil, *Micrometeoroids, *Microparticles, *Projectile cratering, *Van de graaff accelerators, Meteorite craters, Minerals, Single crystals, Spalling.

For abstract, see STAR 11 07.

N73-16814 PC$4.25/MF$0.95
National Aeronautics and Space Administration. Goddard Inst. for Space Studies, New York.
STELLAR EVOLUTION OF HIGH MASS BASED ON THE LEDOUX CRITERION FOR CONVECTION.
R. Stothers, and C. Chin. 1972, 42p NASA-TM-X-68914

Descriptors: *Convective flow, *Main sequence stars, *Stellar evolution, Astrophysics, Nuclear energy.

For abstract, see STAR 11 07.

N73-16816 PC$3.00/MF$0.95
Lowell Observatory, Flagstaff, Ariz.
HIGH RESOLUTION MEASURES OF POLARIZATION AND COLOR OF SELECTED LUNAR AREAS.
L. A. Riley, and J. S. Hall. 7 Aug 72, 17p
NASA-CR-130018, BULL-159
Grant NSG-45

Descriptors: *High resolution, *Lunar landing sites, *Lunar topography, Extinction, Lunar maria, Polarized radiation, Surface properties.

For abstract, see STAR 11 07.

N73-16818 PC$5.25/MF$0.95
Bern Univ. (Switzerland).
NOBLE GAS INVESTIGATIONS OF LUNAR ROCKS 10017 AND 10071.
P. Eberhardt, J. Geiss, H. Graff, N. Groegler, and U. Kraehenbuehl. Sep 72, 63p
Subm- Submitted for Publication

Descriptors: *Abundance, *Lunar rocks, *Radioactive age determination, *Rare gases, Apollo 11 flight, Chronology, Feldspars, Igneous rocks, Ilmenite, Spallation.

For abstract, see STAR 11 07.

N73-16820 PC$4.25/MF$0.95
Royal Greenwich Observatory, Herstmonceux (England).
AN ABUNDANCE ANALYSIS OF ALPHA CENTAURI.
V. A. French, and A. L. Powell. 1971, 42p
BULL-173

Descriptors: *Binary stars, *Centaurus constellation, *Chemical composition, *Line spectra, Abundance, Metals, Spectrum analysis, Stellar spectra, Stellar spectrophotometry, Stellar structure.

For abstract, see STAR 11 07.

N73-16821 PC$6.75/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
A COMPUTER PROGRAM FOR MODELING NON-SPHERICAL ECLIPSING BINARY STAR SYSTEMS.
D. B. Wood. Dec 72, 94p NASA-TM-X-66155, X-110-72-473

Descriptors: *Astronomical models, *Computer programs, *Eclipsing binary stars, Curves (geometry), Light emission, Mathematical models, Optical paths.

For abstract, see STAR 11 07.

N73-16824 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
MODELS OF VENUS ATMOSPHERE (1972).
Space Vehicle Design Criteria (Environment) Sep 72, 63p NASA-SP-8011-REV

Descriptors: *Atmospheric models, *Venus atmosphere, Quantitative analysis, Satellite observation.

For abstract, see STAR 11 07.

N73-16826 PC$4.50/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ULTRAVIOLET PHOTOMETRY FROM THE ORBITING ASTRONOMICAL OBSERVATORY. 8 THE BLUE AP STARS.
D. S. Leckrone. Jan 73, 49p NASA-TM-X-66163, X-671-73-13
Subm- Submitted for Publication

Descriptors: *Oao 2, *Optical filters, *Photometry, *Stars, A stars, B stars, Dwarf stars, Giant stars, Ultraviolet radiation.

For abstract, see STAR 11 07.

N73-16827 PC$3.00/MF$0.95
Linguistic Systems, Inc., Cambridge, Mass.
THE FUTURE BELONGS TO ASTROPHYSICS.
L. A. Artsimovich. Feb 73, 9p NASA-TT-F-14670
Contract NASW-2482
Tran- Transl. Into English From Priroda (Moscow), No. 9, Sep. 1972 P 2-4

Descriptors: *Astrophysics, *Histories, *Nuclear physics, *Physics, Atomic physics, Research and development, Theoretical physics.

For abstract, see STAR 11 07.

N73-16831 PC$3.00/MF$0.95
Translation Consultants, Ltd., Arlington, Va.
SPECTROGRAMS OF ALPHA LYRAE AND BETA CENTAURI IN THE RANGE OF 2000-3800 ANGSTROMS.
V. I. Patsayev. Jan 73, 8p NASA-TT-F-14582
Contract NASW-2038
Tran- Transl. Into English From Soobshch. Byurakansk. Obs. (USSR, No. 45, 1972 P 20-26

Descriptors: *Salyut space station, *Spaceborne telescopes, *Stellar spectrophotometry, Centaurus constellation, Fog, Gamma rays, Ionization, Lyrae constellation, Ultraviolet spectra.

For abstract, see STAR 11 07.

N73-16833 PC$3.50/MF$0.95
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
MIE SCATTERING OF THE INTERPLANETARY MAGNETIC FIELD BY THE WHOLE MOON.
C. P. Sonett, and D. S. Colburn. Jan 73, 27p
NASA-TM-X-62225

Descriptors: *Interplanetary magnetic fields, *Mie scattering, *Moon, Excitation, Lunar topography, Magnetometers.

For abstract, see STAR 11 07.

N73-16834 PC$4.25/MF$0.95
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
NIGHTSIDE ELECTROMAGNETIC RESPONSE OF THE MOON.
G. Schubert, B. F. Smith, C. P. Sonett, D. S. Colburn, and K. Schwartz. Oct 72, 41p
NASA-TM-X-62226
Contract NAS2-6876

Descriptors: *Interplanetary magnetic fields, *Lunar far side, *Lunar magnetic fields, *Magnetic measurement, *Time series analysis, Apollo 12 flight, Data reduction, Electrical resistivity, Explorer 35 satellite, Magnetic probes.

For abstract, see STAR 11 07.

N73-16837 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
COMPOSITIONS OF MAJOR AND MINOR MINERALS IN FIVE APOLLO 12 CRYSTALLINE ROCKS.
B. M. French, K. F. Heinrich, P. D. Loman, Jr., A. S. Doan, Jr., and I. Adler. 1972, 145p
NASA-SP-306
Misc- Original Contains Color Illustrations

Descriptors: *Apollo 12 flight, *Crystallinity, *Lunar rocks, *Mineralogy, *Petrology, Lava, Lunar craters, Lunar photographs, Microanalysis.

For abstract, see STAR 11 07.

N73-16839 PC$3.00/MF$0.95
National Aeronautics and Space Administration, Washington, D.C.
THE MOON AND THE PLANETS (SPACE PROGRAM).
V. P. Denisov, and V. I. Alimov. Feb 73, 44p
NASA-TT-F-767
Tran- Transl. Into English of the Book Luna I Planety (Kosmicheskaya Programma)Moscow, Znaniye Press, 1971 P 3-32

Descriptors: *Manned space flight, *Solar system, *Space exploration, Astronomical spectroscopy, Chemical properties, Radar measurement.

For abstract, see STAR 11 07.

N73-16862 PC$8.50/MF$0.95
Arbeitsgruppe Fuer Physikalische Weltraumforschung, Freiburg (West Germany).
SOLAR OBSERVATIONS AND RESEARCH BY MEANS OF ROCKETS . SONNENBEOBACHTUNG UND -FORSCHUNG MIT RAKETEN.
G. Schmidtke. Aug 72, 126p BMBW-FB-W-72-27
Subm- Sponsored By Bundesmin. Fuer Bildung Und Wiss.

Descriptors: *Germany, *Rocket-borne instruments, *Solar physics, *Space programs, Far ultraviolet radiation, Pointing control systems, Solar spectrometers, Solar x-rays, Stratoscope telescopes.

For abstract, see STAR 11 07.

N73-16863 PC$3.00/MF$0.95
Royal Inst. of Tech., Stockholm (Sweden). Dept. of Plasma Physics.
ON THE POSSIBILITY OF A RESONANCE CAPTURE OF THE ASTEROID TORO BY THE EARTH.
L. Danielsson, and R. Mehra. Aug 72, 20p
TRITA-EPP-72-19

Descriptors: *Asteroids, *Capture effect, *Earth (planet), *Orbit perturbation, *Resonance, Earth (planet), Libration, Orbit calculation, Orbital elements.

For abstract, see STAR 11 07.

N73-16864 PC$3.25/MF$0.95
Office National Detudes Et de Recherches Aerospatiales, Toulouse (France). Dept Detudes Et de Recherches en Technologie Spatiale.
SCANNING ELECTRON MICROSCOPE AND ENERGY DISPERSIVE X-RAY ANALYSIS OF THE SURFACE FEATURES OF SURVEYOR 3 TELEVISION MIRROR.
J. C. Mandeville. Dec 72, 22p ONERA-NT-01-15

Descriptors: *Electron microscopes, *Mirrors, *Projectile cratering, *Surveyor 3 lunar probe, *X ray analysis, Lunar dust, Meteoritic damage, Scanning, Surface defects, Television cameras.

For abstract, see STAR 11 07.

TRITA-EPP-72-18 PC$3.00/MF$0.95
Kungliga Tekniska Hogskolan, Stockholm (Sweden).
COMET- METEOR STREAM COMPLEX.
D. A. Mendis. Aug 72, 25p
U. S. Sales only

Descriptors: *Comets, *Meteors.

For abstract, see NSA 27 06, number 12864.

4. ATMOSPHERIC SCIENCES

4A. Atmospheric Physics

AD-757 059 PC$3.00/MF$0.95
Institute for Defense Analyses Arlington Va
ON THE PROBLEM OF ELIMINATING NITRIC OXIDE FROM JET-ENGINE EXHAUST,
J. W. Chamberlain. Aug 72, 7p* Rept no. N-815
IDA/HQ-72-14447

Descriptors: (*Supersonic planes, *Exhaust gases), (*Air pollution, Exhaust gases), (*Stratosphere, *Ozone), (*Nitrogen oxides, Stratosphere), Reaction kinetics, Excitation, Atoms, Oxygen, Photochemistry.
Identifiers: *Aeronomy, *Nitrogen oxide (NO), Nitrogen oxide (N2O), Oxygen atoms.

The report discusses the possibility that nitric oxide (NO) in the exhaust of a fleet of SSTs could seriously affect the ozone equilibrium of the stratosphere. In this connection it has been suggested that artificial excitation (vibrational or electronic) of NO in the combustion chamber could increase its reaction rate so that NO is converted into the more inert N2. The maximum rate that could likely be thus obtained seems inadequate to deplete the NO abundance appreciably. However, there are still uncertainties in the parameters and the mechanism cannot be totally discounted. (Author)

AD-757 085 PC$3.00/MF$0.95
Washington Univ Seattle
STIMULATED AMPLIFICATION OF VLF AND ULF WAVES IN THE MAGNETOSPHERE BY LOCALIZED INJECTIONS OF PLASMA CLOUDS AND PARTICLE BEAMS.
Final rept.,
Harold B. Liemohn, and G. K. Parks. Dec 72, 135p
Contract N00014-67-0103-0027, ARPA Order-1479
Prepared in cooperation with Battelle Memorial Inst., Richland, Wash., Pacific Northwest Labs.

Descriptors: (*Magnetosphere, Plasma physics), (*Radio transmission, Magnetosphere), Very low frequency, Ultralow frequency, Cyclotron resonance phenomena, Ionospheric disturbances, Electron beams, Proton beams, Lithium, Barium, Computer programs.
Identifiers: Chemical release studies.

The cyclotron resonance interaction between ULF-VLF waves and trapped particles may be strongly enhanced in the magnetosphere by the injection of either cold plasma or energetic particle beams. A variety of natural conditions and injections are investigated numerically using the linear theory. Both satellite and rocket injection of cold plasma provide significant enhancements of amplification. Conventional hot electron beams may also amplify narrow frequency bands, if the beam geometry can be effectively altered at injection. Heavy ion beams appear to offer attractive propagation conditions as well as stimulate amplification. (Author)

AD-757 095 PC$3.00/MF$0.95
Lockheed Missiles and Space Co Inc Palo Alto Calif Palo Alto Research Lab
SUMMARY OF INSTITUTE PROCEEDINGS: PHYSICS AND CHEMISTRY OF UPPER ATMOSPHERES.
Final rept.,
Billy McCormac, and Robert Varney. Dec 72, 61p
Rept no. LMSC-D311471 DNA-3026F
Contract DNA001-72-C-0159

Descriptors: (*Upper atmosphere, Physical properties), Density, Chemical elements, Atmospheric temperature, Wind, Barometric pressure, Heating, Photochemistry, Planetary atmospheres.
Identifiers: Atmospheric physics, Atmospheric density, Atmospheric composition, Solar ultraviolet radiation.

Contents:
Structure and composition of the atmosphere;
Eddy diffusion;
Electromagnetic transport processes;
UV Heating;
Precipitating electrons;
Chemical processes and models;
Other planets.

AD-757 256 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
AN OPTICAL APPARATUS TO DETERMINE THE EFFECT OF TURBULENCE ON THE MODULATION TRANSFER FUNCTION OF THE ATMOSPHERE.
Master's thesis,
Wayne Thompson Hildebrand. Dec 72, 43p

Descriptors: (*Atmosphere, Optical properties), Optical instruments, Transfer functions, Coherent radiation, Optical images, Degradation, Turbulence, Experimental design, Test equipment, Computer programs, Theses, Light communication systems.
Identifiers: Modulation transfer functions, Laser beams, Atmospheric attenuation.

An apparatus was designed and constructed to determine the effect of atmospheric turbulence on the modulation transfer function (MTF) of the atmosphere. A reflecting telescope and reticle system provided optical information in the visible region to a silicon photodiode detector which was responsive from .35 micron to 1.1 microns. The output of the detector was processed to measure irradiance modulation from a target of known spatial frequency. The modulation transfer function of the atmospheric transmission medium and the optical system was measured under calm conditions and conditions of turbulence on a 270 meter round trip path through a building corridor. The optical apparatus described was capable of detecting, in the visible range, the degrading effect of turbulence on MTF. All reflective optics were used so that the visual through 10 micrometers range can be covered with use of different detectors. (Author)

AD-757 275 PC$6.75/MF$0.95
Massachusetts Inst of Tech Cambridge Dept of Electrical Engineering
AN ATMOSPHERIC NOISE MODEL WITH APPLICATION TO LOW FREQUENCY NAVIGATION SYSTEMS.
Doctoral thesis,
Donald Alexander Feldman. 30 Jun 72, 206p*
Contract DOT-CG-13446-A

Descriptors: (*Atmosphere models, Noise), (*Radio equipment, *Atmospherics), (*Radio navigation, Radio interference), Low frequency, Radio receivers, Optimization, Power spectra, Statistical distributions, Mathematical models, Theses.
Identifiers: *Electromagnetic noise.

A prerequisite of the design of low frequency radio receivers is a model for low frequency atmospheric radio noise that encompasse the non-Gaussian nature of the actual noise process and is sufficiently tractable to enable performance analysis and optimization of receiver designs. This work describes a new model for atmospheric noise waveforms observed at the output of the antenna bandlimiting filter. This model, which is based on statistical analysis of sample records of these waveforms, is used to analyze the performance of typical radio navigation receivers and to determine near optimum receiver performance. The analysis is verified by simulating the receiver structure and testing the receiver with the actual noise sample records. (Author)

AD-757 291 Reprint
Ghana Univ Legon Dept of Physics
EQUATORIAL SCINTILLATION,
John R. Koster. 28 Apr 72, 17p AFCRL-TR-73-0108
Contract F61052-70-C-0004
Availability: Pub. in Planetary and Space Science, v20 p1999-2014 1972.

Descriptors: (*Ionospheric disturbances, Periodic variations), (*Ionospheric propagation, Scintillation), Electron density, Magnetic storms, Correlation techniques, Ghana.
Identifiers: F region, Faraday effect, Seasonal variations.

Equatorial scintillations have been observed at Legon, Ghana for nearly 20 yr. The occurrence characteristics of the scintillations are reviewed, and the physical characteristics of the electron density irregularities summarized. A much more comprehensive summary of the seasonal variation of scintillation is given, and it is found to be remarkably similar to the variations in thermospheric temperature. Evidence for the suppression of scintillation during magnetic disturbances is given. Curves for the daily variation of the Faraday rotation angle are presented and their unusual post-sunset behavior noted. (Author Modified Abstract)

AD-757 295 Reprint
Arizona Univ Tucson Inst of Atmospheric Physics
RADAR AS A DIAGNOSTIC TOOL FOR LIGHTNING,
G. A. Dawson. 5 Apr 72, 11p Rept no. Reprint-293
Grant NSF-GA-27351
Revision of report dated 12 Jan 72.
Availability: Pub. in Jnl. of Geophysics Research, v77 n24 p4518-4528, 20 Aug 72.

Descriptors: (*Lightning, *Radar echo areas), Ionization, Plasma medium, Electron density.

The radar cross section of a cloud-to-ground lightning stroke is calculated for the two limiting cases of overdense and underdense plasma. By using a model of the decaying channel and smoothly joining these limiting cases, curves of the temporal variation of the radar cross section can be obtained. Results are presented for wavelengths of 3.2, 10, 23, and 150 cm. (Author Modified Abstract)

AD-757 309 Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
IONOSPHERIC SHOCK FRONT FROM APOLLO 15 LAUNCHING,
P. R. Arendt. 21 Dec 71, 4p
Availability: Pub. in Nature Physical Science, v236 n62 p8-10, 6 Mar 72.

Descriptors: (*Ionospheric disturbances, Launch vehicles (Aerospace)), (*Microbarometric waves, Manned spacecraft), Shock waves, Ionospheric propagation.
Identifiers: Apollo 15 spacecraft.

Ionospheric perturbations observed at Fort Monmouth, New Jersey, over a distance of more than 1,200 km following the launch of Apollo 14 were attributed to the arrival of an atmospheric shock front which splits at ionospheric heights into ion acoustic and normal acoustic modes. An opportunity to repeat these observations was provided by the launching of Apollo 15 on July 26, 1971, at 0834 EST. (Author)

AD-757 358 PC$6.00/MF$0.95
Stanford Research Inst Menlo Park Calif
DNA PROJECT 617 RADAR: AURORAL IONOSPHERIC MEASUREMENTS.
Final rept. 15 Nov 71-15 Nov 72,
M. J. Baron. Dec 72, 313p DNA-3023F
Contract DNA001-72-C-0076

Descriptors: (*Ionosphere, Plasma physics), Atmospheric sounding, Radar reflections, Incoherent scattering, Electric fields, Aurorae, Ionization, Electron density, Radar clutter, Ionospheric disturbances, Solar radiation, Magnetic storms, Solar eclipses, Alaska.

The DNA Project 617 incoherent-scatter radar has been operating at its Chatanika, Alaska location for eighteen months. This report describes the research studies pursued by SRI in 1972, including the following: Investigation of high-latitude ionospheric plasma-transport phenomena; Studies of ionospheric plasma interaction with the neutral atmosphere; Studies of auroral ionization; Correlative studies with the Homer Project 609 auroral clutter radar; Radar measurements in support of rocket-borne experiments (including ICE CAP '72); Diurnal/seasonal behavior of the auroral ionosphere; Measurements of the ionospheric effects of the August 1972 solar storm; Effects of the 10 July 1972 total solar eclipse; Investigation of ionospheric conditions responsible for spread-F.

AD-757 427 PC$3.00/MF$0.95
Naval Electronics Lab Center San Diego Calif
A HIGH-SPEED DIGITAL RECORDING SYSTEM FOR VLF AND ELE SFERIC WAVEFORMS.
Interim rept.,
Robert J. Gallenberger. 10 Nov 72, 39p Rept no. NELC-IR-208-1

Descriptors: (*Atmospherics, *Digital recording systems), Extremely low frequency, Very low frequency, Lightning, Magnetic recording systems, Systems engineering, Programming (Computers).

The report describes a system for digitally recording atmospheric noise (sferics). The system records on magnetic tape the received sferic waveforms, sferic direction of arrival and time of arrival. Recording rates of several thousand per minute are possible. Three systems have been constructed and simultaneously operated at widely separated locations. Preliminary results from the three station test are discussed. (Author)

AD-757 480 PC$3.00/MF$0.95
Arcon Corp Wakefield Mass
MATHEMATICAL AND STATISTICAL ANALYSIS FOR THE REDUCTION OF IONOSPHERIC DATA AND OTHER PHYSICAL SYSTEMS,
Manfred Friedman, David C. Miller, Krishna-S. Vanguri, Joseph Gibbs, and Jean Hsiung. Nov 72, 133p Rept no. Scientific-2 AFCRL-TR-73-0049
Contract F19628-71-C-0034

Descriptors: (*Ionosphere, Electron density), (*Ionospheric propagation, Mathematical models), Atmosphere models, Polar regions, Ionospheric disturbances, Sunspots, Correlation techniques, Regression analysis, Time series analysis, Programming (Computers).
Identifiers: Data reduction, Ray tracing.

The authors describe work involved in the analysis and modeling ionospheric data collected at various places around the globe. This involved correlation studies, regression analysis, fitting nonlinear time series and contour plotting. The authors helped develop a computer package for modeling the polar ionosphere. In addition, they prepared some efficient ray tracing programs, worked on problems for sunspot analysis, reduced and analyzed satellite measurements of electron densities in the ionosphere, and prepared theoretical and numerical solutions of electron transport characteristics in an irradiated solid. (Author Modified Abstract)

AD-757 481 PC$3.00/MF$0.95
TRW Systems Group Redondo Beach Calif
COMPUTER SIMULATION OF ION COLLECTION BY AN IONOSPHERIC PROBE.
Final rept. 1 Dec 71-1 Jan 73,
Frank W. Vogenitz. 1 Jan 73, 82p Rept no. 20982-6001-RU00 AFCRL-TR-73-0006
Contract F19628-72-C-0130

Descriptors: (*Ionosphere, Sampling), (*Atmospheric sounding, Probes (Electromagnetic)), Flow fields, Mass spectroscopy, Ions, Plasma sheath, Monte Carlo method, Mathematical models.
Identifiers: Computerized simulation, Ion density (Concentration), Rarefied gas dynamics.

Monte Carlo calculations of positive ion collection by a flat faced cylindrical probe were carried out at speed ratio 1.5 over a range of (lambda sub infinity)/D (neutral molecule mean free path/cylinder diameter) and (lambda sub D)/D (Debye length/D) at a fixed cylinder front face potential of -10 volts. Under collisionless conditions (lambda sub infinity) >> D) it was found that for (lambda sub D)/D > 1.0 the ion flux to the front face stagnation point was approximately 35 times the field-free ion flux. The stagnation point ion flux decreased rapidly as (lambda sub D)/D was reduced below 1.0, reaching a value of approximately 4 times the field free ion flux at (lambda sub D)/D = .03. The ion flux at (lambda sub D)/D = .03, when scaled to conditions for which flight data were available was found to be a factor of 4 higher than the flight measured flux. (Author Modified Abstract)

AD-757 483 PC$3.00/MF$0.95
Air Force Cambridge Research Labs L G Hanscom Field Mass
A NEW MEAN REFERENCE ATMOSPHERE FOR 25 TO 500 KM.
Air Force surveys in geophysics,
K. S. W. Champion, and R. A. Schweinfurth. 2 Oct 72, 28p Rept nos. AFCRL-72-0579, AFCRL-AFSIG-247

Descriptors: (*Atmosphere models, Standards), Atmospheric temperature, Density, Barometric pressure, Nitrogen, Oxygen, Argon, Helium, Tables, Ionosphere, Magnetosphere.
Identifiers: Atmospheric density, Atmospheric composition.

The model was prepared as part of the activities of the Committee on Space Research (COSPAR) panel on new reference atmospheres. It will be published as 'The Mean COSPAR International Reference Atmosphere 1972.' The reference atmospheres aid in the design of aircraft, missiles and satellites. The Mean Atmosphere, provided for the altitude range 25 to 500 km, contains tables of temperature, density, and pressure for the whole range. Composition (major constituents and some minor constituents) is given for the range 75 to 500 km. The model represents mean annual and solar cycle conditions for latitudes near 30 degrees. (Author)

AD-757 490 PC$3.50/MF$0.95
Air Force Cambridge Research Labs L G Hanscom Field Mass
A MATHEMATICAL MODEL OF THE EVOLUTION OF RADIATION FOG,
I. M. Zakharova. 12 Dec 72, 29p Rept nos. AFCRL-72-0720, AFCRL-Trans-100
Trans. of Institut Eksperimentalnoi Meteorologii. Trudy (USSR) n23 p157-175 1971.

Descriptors: (*Fog, Mathematical models), Water vapor, Heat transfer, Condensation, Equations of motion, Infrared radiation, USSR.
Identifiers: Translations.

A system of equations is given which describes the evolution of radiation fog from the moment of its inception to the time of its dispersion. The coefficient of turbulent exchange is considered an unknown value, and for closing of the system, equations of the dynamics of a nonstationary stratified boundary layer are used. In the system of equations, one takes into account the radiational thermal exchange in the atmosphere and the effect of gravitational forces on the water content in the fog, and one establishes in the first approximation the relationship between macroprocesses and microprocesses. (Author)

AD-757 494 PC$3.00/MF$0.95
Radiation Research Associates Inc Fort Worth Tex
MONTE CARLO STUDIES OF LIGHT TRANSPORT THROUGH NATURAL ATMOSPHERES.
Final rept. 1 Feb 70-31 Dec 72,
Wolfram Blattner, and Michael B. Wells. 31 Jan 73, 105p Rept no. RRA-T7304 AFCRL-TR-73-0109
Contract F19628-70-C-0156

Descriptors: (*Atmosphere, *Light transmission), Scattering, Monte Carlo method, Fog, Visibility, Aerosols, Dust, Refractive index, Twilight.
Identifiers: Atmospheric scattering, Light scattering, Mie scattering.

The report describes work performed on six major work areas: Modification to the FLASH procedure and its application to solar almucantar, horizon brightness, and twilight scattering studies; Development of the BRITE procedure for treating light scattering in a plane parallel atmosphere with the backward Monte Carlo method. Application of the FLARE procedure to evaluate the effect of multiple scattering on the angular intensity reaching a receiver from a point isotropic source; Modifications of the LITE-IV procedure for use in path radiance and path reflectance calculations; Applications of the TPART-I procedure to studies of radiation transport in foggy atmospheres for use in determining the effects of scattering on visibility measurements made with optical transmission instruments; and, Modifications to the MIE2 procedure and development of the MIE3, MIE4, and MIE5 procedures for calculating scattering cross sections and phase function data for homogeneous spherical particles and for particles having a spherical shell of different materials, and the application of these programs to calculations of scattering data for visible and infrared light. (Author Modified Abstracts)

AD-757 505 PC$3.00/MF$0.95
Aerospace Corp El Segundo Calif Lab Operations
LABORATORY STUDIES OF COLLISIONS OF ENERGETIC H (+) AND H WITH ATMOSPHERIC CONSTITUENTS.
Rept. for Jan-Nov 72,
Robert J. McNeal, and John H. Birely. 30 Dec 72, 158p Rept no. TR-0073 (9260-01)-9 SAMSO-TR-73-87
Contract F04701-72-C-0073

Descriptors: (*Upper atmosphere, Proton bombardment), (*Aurorae, Protons), (*Proton bombardment, *Gas ionization), Hydrogen, Excitation, Differential cross section, Emissivity, Electrons, Atoms, Nitrogen, Oxygen, Dissociation.
Identifiers: *Ion molecule interactions, Hydrogen atoms, Lyman alpha radiation.

In the paper, the authors present an account of the current status of laboratory measurements applicable to the interaction of fast protons and hydrogen atoms with the earth's atmosphere. Data are also presented for some gases found in the atmospheres of other planets. After a brief discussion of recent measurements of the auroral particle energy spectra in order to define the energy range for relevant laboratory measurements, the motion of energetic protons in the atmosphere is discussed to eludicate further the cross sections and quenching processes of interest. A review of ionization experiments follows with emphasis on data acquired in the last decade. Cross sections for excitation of the atmospheric target gases and fast hydrogen projectiles are then presented. Application of the data to auroral calculations is also discussed. (Author)

AD-757 507 PC$3.00/MF$0.95
Aerospace Corp El Segundo Calif Lab Operations
A PHENOMENOLOGICAL MODEL OF GLOBAL IONOSPHERIC ELECTRON DENSITY IN THE E, FL, AND F2 REGIONS.
Rept. for May-Dec 72,
Barbara K. Ching, and Yam T. Chiu. 1 Mar 73, 51p Rept no. TR-0073 (3260-10)-8 SAMSO-TR-73-91

Contract F04701-72-C-0073

Descriptors: (*Ionosphere, Electron density), Atmosphere models, Diurnal variations.
Identifiers: E region, F 1 region, F 2 region.

A global phenomenological model of the large scale variations of ionospheric electron density with the annual, diurnal and solar activity cycles has been constructed from monthly-averaged hourly ionospheric sounding data from some 50 stations spanning the years 1957-1970 as provided by World Data Center (A), Boulder, Colorado. The model, summarizing the data in simple empirical formulae and thus requiring little computer storage, is specifically for global thermospheric and ionospheric dynamical calculations such as ion drag, Joule heating and atmospheric dynamo effects which require electron or ion densities as essential inputs. Extensive comparison of the model with data and with other models is discussed. (Author)

AD-757 533 PC$3.00/MF$0.95
IIT Research Inst Chicago Ill
CHEMICAL COMPOSITION OF THE ATMOSPHERE AT 40,000-65,000 FEET USING A MODIFIED MATRIX ISOLATION TECHNIQUE.
Semi-annual rept. 1 Aug 72-31 Jan 73,
Alan Snelson. 2 Feb 73, 77p Rept no. IITRI-C6269-1 AFOSR-TR-73-0487
Contract F44620-73-C-0006

Descriptors: (*Stratosphere, *Samplers), Cryogenics, Design.
Identifiers: *Atmospheric composition, *Gas sampling, *Matrix isolation techniques.

In the near future commercial aircraft (SST's) will be in routine schedule operation. Environmental experts have exhibited a variety of concerns over possible adverse effects the effluents from such flights may have upon the earth's climate. Unfortunately many of these prognostications are based on rather sketchy data as to the normal chemical composition of the atmosphere. In the program the matrix isolation technique is to be adapted to the cryogenic sampling of the atmosphere at altitudes of 40,000-65,000 Ft. The following species are to be monitored: H2O, H2O2, NO, NO2, N2O5, HNO3, O3, OH, HO2, CO, and CH4. The report discusses the design and construction of the cryogenic sampling system and the design and construction of a ground power support system.

AD-757 563 PC$3.00/MF$0.95
Pittsburgh Univ Pa
INTERFEROMETRIC STUDIES OF BARIUM RELEASE.
Final technical rept.,
Manfred A. Biondi. Jan 73, 18p Rept no. APP-37 RADC-TR-73-59
Contract F30602-72-C-0006, ARPA Order-1057
Report on Project Secede.

Descriptors: (*Atmospheric sounding, *Upper atmosphere), Barium, Optical tracking, Interferometers, Environmental tests, Performance (Engineering).
Identifiers: SECEDE 2 project, Chemical release studies, Barium clouds.

The reduction of the Optical Interferometer Secede II data and the design, construction and testing of a rigid mounting cage, pressure housing and thermal housing for a 150 mm aperture Fabry-Perot interferometer are described. Consultation and assistance were provided to R. D. Hake of S.R.I. in the conversion of the interferometer magnetic tape records to ion radiance as a function of spatial scan position in the barium ion cloud. Optical absorption effects at the ion hyperfine wavelength complicate conversion of radiance to ion (and electron) column content, necessitating a radiation transport calculation. The 150 mm Fabry-Perot components were designed and constructed. The assembled instrument is found to maintain high optical resolution in an environment subject to moderate vibration and accelerations. (Author)

AD-757 622 PC$3.00/MF$0.95
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
MESOSCALE VARIATION OF SPECTRAL RADIANCE NEAR 15 MICROMETERS.
Research and development technical rept.,
Louis D. Duncan, and Barbara J. Richart. Jan 73, 30p ECOM-5470

Descriptors: (*Atmosphere, Infrared radiation), Meteorological satellites, Infrared detectors, Radiometers, Atmospheric temperature, Correlation techniques.
Identifiers: Atmospheric radiation, Remote sensing.

The mesoscale variability of outgoing radiation at wavelengths corresponding to the Satellite Infrared Spectrometer (SIRS) channels, which are centered at 750, 734, 709, and 701/cm, has been investigated by using calculated radiances based upon measured temperature data. Temperature profiles measured from six radiosonde stations located on White Sands Missile Range (WSMR), New Mexico, were used with the radiative transfer equation to compute the radiances. Approximately 1750 temperature profiles obtained on 69 separate days were used in the study. The separation distance between pairs of stations varied from 10 to 157 km. (Author Modified Abstract)

AD-757 692 PC$3.00/MF$0.95
Technische Hochschule Aachen (West Germany) Forschungsstelle Fuer Geophysik Und Meteorologie
MASS TRANSFER IN THE LOWER ATMOSPHERE.
Final technical rept.,
M. Horbert, C. de La Riva, and L. Jantowsky. Dec 72, 188p
Contract DAJA37-72-C-0490

Descriptors: (*Atmospheric motion, Scientific research), Low-altitude, Diffusion, Wind, Atmospheric temperature, Humidity, Equations of motion, Statistical data, West Germany.
Identifiers: Mass transfer, Turbulent diffusion.

Starting with the second phase of the present research program on atmospheric eddy transport, the following items were delivered: eddy diffusivity at 2 different sites, over periods of several weeks, wind and (humid) temperature profiles, statistical evaluation of the dependance of eddy diffusivity on the wind and temperature profiles, theoretical studies leading to the formulae needed for the statistical evaluations, information and systems theoretical considerations leading to a realistic interpretation of the formulae and data given, and a brief introduction into the concepts of systems and information theories. (Author)

CEA-R-3900 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Fontenay-Aux-Roses (France). Centre D'Etudes Nucleaires.
TURBULENT-DIFFUSION VERTICAL TRANSFER COEFFICIENT IN RELATIONSHIP TO THE ELECTRICAL PARAMETERS OF AIR.
Alain Milhau. Jan 71, 51p
Lang- In French. Thesis. U. S. Sales only

Descriptors: *Atmosphere, *Ions.

For abstract, see NSA 27 06, number 14355.

CEA-R-4216 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Fontenay-Aux-Roses (France). Centre D'Etudes Nucleaires.
BEHAVIOR OF VOLATILE DROPLETS IN A CONTROLLED ATMOSPHERE.
Gerard Perrault. Dec 71, 194p
Lang- In French. Thesis. U. S. Sales only

Descriptors: *Drops.

For abstract, see NSA 27 06, number 14356.

COM-73-50228 Not available NTIS
National Bureau of Standards, Washington, D.C.
GENERATION AND PROPAGATION OF SOUND WAVES BETWEEN THE IONOSPHERE AND THE LOWER ATMOSPHERE.
Final rept.,
Richard K. Cook. 1972, 6p
Pub. in Proceedings of Conference on Effects on Atmospheric Acoustic Gravity Waves on Electromagnetic Wave Propagation, (115th) Wiesbaden (Germany) 17-21 Apr 72, Nov 72, p3-1--3-6.

Descriptors: (*Atmospheric motion, Gravity waves), Sound waves, Ionospheric propagation.
Identifiers: Acoustic gravity waves, Infrasonic radiation.

Various physical processes generate sound waves at infrasonic frequencies (oscillation periods > 1.0 sec) in the lower atmosphere. Some typical sources are volcanic explosions, earthquakes, severe storms, and the shock waves from vehicles moving at supersonic speeds. In the ionosphere, sources of infrasound include auroral discharges and shock waves from satellites and meteorites moving at supersonic speeds. The author presents the results of an analysis for the generation of sound and propagation downwards due to the heating effects of auroral discharges, particularly those traveling at supersonic speeds in directions parallel to the earth's surface. The 'shock' waves from such discharges are propagated steeply downward with very little loss of energy from absorption by viscosity and heat conduction, and are frequently observed at infrasonic stations located at high latitudes. An estimate of auroral heating is derived from the observed strengths of infrasound at the earth's surface. (Author)

N73-16340 PC$4.25/MF$0.95
California Univ., Los Angeles. Plasma Physics Group.
CONVECTIVE AMPLIFICATION OF TYPE 1 IRREGULARITIES IN THE EQUATORIAL ELECTROJET.
K. Lee, and C. F. Kennel. Nov 72, 41p
NASA-CR-130382, PPG-136
Contracts NGL-05-007-190, N00014-69-A-0200-4023

Descriptors: *Atmospheric refraction, *Equatorial electrojet, *Wave propagation, Backscattering, Doppler effect, Electrons, Frequency shift.

For abstract, see STAR 11 07.

N73-16341 PC$3.50/MF$0.95
Colorado State Univ., Fort Collins. Dept. of Atmospheric Science.
MEASUREMENTS OF THE ENERGY EXCHANGE BETWEEN EARTH AND SPACE FROM SATELLITES DURING THE 1960S.
T. H. Vonderhaar, and E. Raschke. Apr 72, 29p
NASA-CR-130152, REPT-184
Contract NGR-06-002-102
Subm- Submitted for Publication

Descriptors: *Earth albedo, *Energy budgets, *Energy transfer, *Meteorological satellites, *Radiation measurement, Atmospheric circulation, Bolometers, Infrared radiation, Oceanography, Solar radiation.

For abstract, see STAR 11 07.

N73-16342 PC$11.00/MF$0.95
Stanford Univ., Calif. Inst. for Plasma Research.
LINEAR AND NONLINEAR STABILITY CHARACTERISTICS OF WHISTLERS.
A. L. Brinca. Oct 72, 176p NASA-CR-130349, SU-IPR-489
Contract NGL-05-020-176

Descriptors: *Plasmas (physics), *Wave propagation, *Whistlers, Cold plasmas, High temperature plasmas, Linearity, Magnetic fields, Nonlinearity.

For abstract, see STAR 11 07.

N73-16344 PC$11.75/MF$0.95
Stanford Univ., Calif. Radioscience Lab.
THE STRUCTURE OF THE MAGNETOSPHERE AS DEDUCED FROM MAGNETOSPHERICALLY REFLECTED WHISTLERS.
B. C. Edgar. Mar 72, 195p NASA-CR-130352, SU-TR-3438-2
Contracts NAS5-2131, NGR-05-020-288

Descriptors: *Magnetosphere, *Ogo-a, *Ogo-b, *Whistlers, Ions, Lightning, Very low frequencies.

For abstract, see STAR 11 07.

N73-16345 PC$7.75/MF$0.95
Stanford Univ., Calif. Radioscience Lab.
METHODS OF DETERMINING ELECTRON CONCENTRATIONS IN THE MAGNETOSPHERE FROM NOSE WHISTLERS.
C. G. Park. Jan 72, 113p NASA-CR-130353, SU-TR-3454-1
Contracts NGL-05-020-008, NSF GA-19608

Descriptors: *Electrons, *Magnetosphere, *Whistlers, Magnetic fields, Wave propagation, Waveguides.

For abstract, see STAR 11 07.

N73-16413 PC$3.00/MF$0.95
National Physical Lab., New Delhi (India). Radio Science Div.
ELECTRON COOLING IN THE F2-REGION AT LOW AND MID-LATITUDES.
K. K. Mahajan, and S. Kumari. May 72, 15p RSD-74, SR-74

Descriptors: *Cooling, *Electron density (concentration), *F 2 region, Electron energy, Impact strength, Particle collisions.

For abstract, see STAR 11 07.

N73-16414 PC$3.00/MF$0.95
National Physical Lab., New Delhi (India). Radio Science Div.
ANOMALOUS BEHAVIOR OF F-REGION DURING SOLAR ECLIPSE OF 22 SEPTEMBER 1968.
R. Venkatachari, and L. H. Sarma. May 72, 19p RSD-73, SR-73

Descriptors: *F region, *Ionospheric disturbances, *Solar eclipses, Absorption spectra, Cosmic noise, Cosmic rays, India.

For abstract, see STAR 11 07.

N73-16415 PC$3.00/MF$0.95
National Physical Lab., New Delhi (India). Radio Science Div.
A STUDY OF THE EQUATORIAL D-REGION.
Y. V. Somayajula, M. B. Avadhanulu, and K. S. Zalpuri. Jun 73, 19p RSD-76
Conf- Presented At Cospar Symp., Madrid, May 1972

Descriptors: *D region, *Electron density (concentration), Cosmic rays, Ionization, Lyman alpha radiation.

For abstract, see STAR 11 07.

N73-16416 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
PHOTOELECTRON ESCAPE FLUXES OVER THE EQUATORIAL AND MIDLATITUDE REGIONS.
B. C. Narasingarao, R. Singh, and E. J. Maier. Jun 72, 20p NASA-TM-X-68921, RSD-75
Subm- Submitted for Publication Prepared in Cooperation With Natl. Phys. Lab., New Delhi

Descriptors: *Equatorial electrojet, *Explorer 31 satellite, *Photoelectric emission, Density, Electron distribution.

For abstract, see STAR 11 07.

N73-16417 PC$3.00/MF$0.95
National Physical Lab., New Delhi (India). Radio Science Div.
ON THE POSSIBILITY OF DEVELOPING THEORETICAL MODELS OF THE DISTURBED F-REGION.
Y. V. Somayajulu. Jul 72, 15p RSD-77, SR-77
Conf- Presented At Conf. on Ionospheric Models, University Park, Pa., 15-18 Jun. 1971

Descriptors: *Atmospheric models, *F region, Ionospheric disturbances, Theoretical physics.

For abstract, see STAR 11 07.

N73-16426 PC$5.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
MOMENT EXPANSION FOR IONOSPHERIC RANGE ERROR.
A. Mallinckrodt, R. Reich, H. Parker, and J. Berbert. Aug 72, 59p NASA-TM-X-66159, X-550-72-298
Contracts NAS5-21728, NAS5-10600
Subm- Prepared Jointly With Commun. Res. Labs. and RCA Serv. Co., Camden, N. J.

Descriptors: *Elevation angle, *Ionospheric propagation, *Range errors, *Refractivity, Radio wave refraction, Ray tracing, Satellite tracking.

For abstract, see STAR 11 07.

N73-16427 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ON THE DETERMINATION OF THE HARMONIC COMPONENTS OF THE DIURNAL VARIATION OF THE THERMOSPHERE FROM SATELLITE DRAG DATA.
P. W. Blum. Nov 72, 8p NASA-TM-X-66160, X-621-72-501
Subm- Submitted for Publication

Descriptors: *Atmospheric density, *Atmospheric models, *Diurnal variations, *Harmonics, *Satellite drag, *Thermosphere, Annual variations, Atmospheric temperature, Radar scattering.

For abstract, see STAR 11 07.

N73-16433 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE EFFECT OF AN ISOTOPIC NON-EQUILIBRIUM PLASMA ON ELECTRON TEMPERATURE MEASUREMENTS.
R. F. Benson, and W. R. Hoegy. Dec 72, 15p NASA-TM-X-66158, X-621-72-496
Subm- Submitted for Publication

Descriptors: *Electron energy, *Ionospheric electron density, *Plasma dynamics, *Velocity distribution, Electron plasma, Ionospheric sounding, Ionospheric temperature.

For abstract, see STAR 11 07.

N73-16436 PC$3.00/MF$0.95
Pittsburgh Univ., Pa.
THE ALTITUDE OF THE SCATTERING LAYER NEAR THE MESOPAUSE OVER THE SUMMER POLES.
T. M. Donahue, and B. Guenther. Dec 72, 11p NASA-CR-130271, SRCC-182
Contracts NAS5-11077, NSF GA-27638

Descriptors: *Atmospheric scattering, *Mesopause, *Ogo-f, *Polar regions, Noctilucent clouds, Photometers, Rayleigh scattering.

For abstract, see STAR 11 07.

N73-16438 PC$3.25/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
HIGH LATITUDE PROTON PRECIPITATION AND LIGHT-ION DENSITY PROFILES DURING THE MAGNETIC STORM INITIAL PHASE.
J. L. Burch. Jan 73, 25p NASA-TM-X-66166, X-646-73-15

Descriptors: *Ion density (concentration), *Magnetic storms, *Polar regions, *Proton precipitation, Plasmapause, Profiles, Proton energy.

For abstract, see STAR 11 07.

N73-16441 PC$4.25/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
PROPOSED REVISION TO THE US STANDARD ATMOSPHERE 86 TO 200 KM.
Report of Task Group 2 To Coesa.
R. A. Minzner, C. A. Reber, K. S. Champion, O. K. Moe, and A. O. Nier. Jan 73, 44p NASA-TM-X-66171, X-621-73-26

Descriptors: *Atmospheric models, *Meteorological parameters, Atmospheric density, Atmospheric pressure, Atmospheric temperature, Thermodynamics.

For abstract, see STAR 11 07.

N73-16442 PC$3.50/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
A MAGNETOSPHERIC FIELD MODEL INCORPORATING THE OGO 3 AND 5 MAGNETIC FIELD OBSERVATIONS.
M. Sugiura, and D. J. Poros. Jan 73, 27p NASA-TM-X-66172, X-645-73-34

Descriptors: *Magnetic fields, *Magnetosphere, *Mathematical models, *Ogo-b, *Ogo-d, Neutral sheets, Ring currents, Toroidal discharge.

For abstract, see STAR 11 07.

N73-16454 PC$3.75/MF$0.95
Max-planck-institut Fuer Physik Und Astrophysik, Munich (West Germany).
RESULTS FROM BARIUM CLOUD RELEASES IN THE IONOSPHERE AND MAGNETOSPHERE.
G. Haerendel. Jul 72, 31p
MPI-PAE/EXTRATERR-67
Conf- Presented At the 15th Plenary Cospar Meeting, Madrid, May 1972

Descriptors: *Barium, *Plasma clouds, *Shaped charges, Alignment, Auroral zones, Cold plasmas, Conjugate points, Geomagnetism, Ion beams, Ionosphere, Lines of force, Magnetosphere.

For abstract, see STAR 11 07.

N73-16607 PC$3.00/MF$0.95
Texas A+m Univ., College Station. Dept. of Meteorology.
ATMOSPHERIC ENERGETICS AS RELATED TO CYCLOGENESIS OVER THE EASTERN UNITED STATES.
Ph.D. Thesis

P. W. West. Jan 73, 126p NASA-CR-2189, M-108
Contract NAS8-26751

Descriptors: *Atmospheric models, *Cyclones, *Energy budgets, *Synoptic meteorology, Air masses, Atmospheric circulation, Kinetic energy, Rawinsondes, Transport properties.

For abstract, see STAR 11 07.

N73-16822 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
PROVISIONAL HOURLY VALUES OF EQUATORIAL DST FOR JULY, AUGUST, AND SEPTEMBER 1972.
M. Sugiura, and D. J. Poros. Jan 73, 6p
NASA-TM-X-66156, X-645-73-7

Descriptors: *Magnetic storms, *Periodic variations, *Tables (data), Field strength, Magnetic flux.

For abstract, see STAR 11 07.

N73-16832 PC$4.25/MF$0.95
Iowa Univ., Iowa City. Dept. of Physics and Astronomy.
MAGNETOSPHERIC ELECTRON DENSITY MEASUREMENTS FROM UPPER HYBRID RESONANCE NOISE OBSERVED BY IMP-6.
R. R. Shaw, and D. A. Gurnett. Dec 72, 45p
NASA-CR-130273, U-OF-IOWA-72-37
Contracts NAS5-11074, NGL-16-001-043

Descriptors: *Electromagnetic noise, *Electron plasma, *Explorer 34 satellite, *Magnetospheric electron density, *Resonant frequencies, Bernstein energy principle, Cerenkov radiation, Electron density profiles, Plasmapause.

For abstract, see STAR 11 07.

UCRL-74254 PC$3.00/MF$0.95
California Univ., Livermore. Lawrence Livermore Lab.
ZONAL ATMOSPHERIC MODEL ZAM2.
M. C. Maccracken. 26 Oct 72, 64p CONF-721119-1
From 2. Conference On The Climatic Impact Assessment Program- Boston, Ma (14 Nov 1972).

Descriptors: *Atmosphere.

For abstract, see NSA 27 06, number 14450.

4B. Meteorology

AD-757 074 PC$3.00/MF$0.95
Transportation Systems Center Cambridge Mass
CLEAR AIR TURBULENCE RADIOMETRIC DETECTION PROGRAM.
Final rept. 1 Jul 71-30 Jun 72,
George W. Wagner, G. G. Harloulee, and W. E. Brown. Feb 73, 80p* Rept no. TSC-FAA-72-38 FAA-RD-73-20

Descriptors: (*Clear air turbulence, Detection), (*Excitation, Clear air turbulence), Meteorological instruments, Radiometers, Flight testing, Electronic equipment.
Identifiers: Remote sensing.

The report presents the accomplishments of the Clear Air Turbulence Detection Program for the Period Jul 1, 1971 to June 30, 1972. The experimental effort during this time period was devoted mainly to the flight test program, acquisition of flight data and evaluation of flight data obtained. The program established the ability of the DOT/FAA detection system to sense turbulence and verify the encounter by means of other onboard atmospheric sensors. Instrumentation, supporting hardware and interfaces are briefly reviewed. Improvements to the measurement technique are also presented. Included are curves, tables and comments which support the events during particular flights where the data indicates changes in atmospheric conditions were sensed before and during turbulence encounters. (Author Modified Abstract)

AD-757 084 PC$3.00/MF$0.95
TRW Systems Group Redondo Beach Calif
TROPICAL CYCLONES.
Final rept. 19 Apr 71-18 Mar 73,
Francis E. Fendell. Mar 73, 179p Rept no. 18524-6003-RU-00
Contract DAHC04-71-C-0025, ARPA Order-1786
See also report dated Feb 72, AD-737 016.

Descriptors: (*Tropical cyclones, Mathematical models), Convection (Atmospheric), Enthalpy, Wind, Rainfall, Boundary layer, Hydrodynamics, Weather forecasting, Kinetic energy, Flow fields.
Identifiers: *Hurricanes, Hurricane modification, Cloud seeding, Digital simulation, Air water interactions.

After a brief summary of salient observational facts about cumulus convection in the tropical ambient and about tropical cyclones, models for the cyclone-scale structure and maintenance of the quasisteady mature stage of a hurricane are presented and evaluated. Principal attention is devoted to the model developed by Riehl and Malkus in the late 1950's, and to the model developed by Carrier in the early 1970's. (Author Modified Abstract)

AD-757 107 PC$6.00/MF$0.95
Naval Weather Service Command Washington D C
SUMMARY OF SYNOPTIC METEOROLOGICAL OBSERVATIONS. JAPANESE AND KOREAN COASTAL MARINE AREAS. VOLUME 1. AREA 1 - KUSHIRO, AREA 2 - TOMAKOMAI, AREA 3 - SENDAI.
May 72, 482p
See also report dated May 72, AD-754 773.

Descriptors: (*Marine meteorology, Seacoast), (*Japan, Meteorological parameters), Wind, Velocity, Cloud cover, Ceiling, Visibility, Humidity, Atmospheric temperature, Fog, Ocean waves, Tables.
Identifiers: Air water interactions, Synoptic meteorology, Kushiro (Japan), Tomakomai (Japan), Sendai (Japan).

Tables of meteorological data are presented for observations off the Japanese coasts of Kushiro, Tomakomiai, and Sendai.

AD-757 225 PC$3.00/MF$0.95
R and D Associates Santa Monica Calif
HISTORICAL CLIMATOLOGY.
Final technical rept. 1 Oct 71-30 Sep 72,
Leona M. Libby. Oct 72, 68p Rept no. RDA-TR-110-NMO AFOSR-TR-73-0444
Contract F44620-72-C-0025, ARPA Order-1964
See also report dated Apr 72, AD-744 129.

Descriptors: (*Climatology, *Geochemistry), Temperature, Trees, Isotope availability, Neutron activation, Organic materials, Feasibility studies, Oxygen, Carbon, Hydrogen.
Identifiers: *Paleoclimatology, Tree ring analysis, Radiocarbon dating.

The research program in Historical Climatology has the general purpose to show feasibility of determining global climate in the past, by determining past trends in surface temperature of the earth. The method being studied involves measuring past temperatures using isotope 'thermometers' in bio-organic bases. For example, isotope ratios in tree rings being formed are expected to change if the temperature changes; thus tree rings formed long ago may exhibit different ratios than those being formed today. Lower limits on the temperature coefficients have been computed, and compared favorably with experimental coefficients. New measurements of these coefficients have been undertaken in water plants. Feasibility of measurement of the isotope ratio by neutron activation for oxygen has been demonstrated and feasibility of measurement of D/H, C13/C12 and O18/O16 has been demonstrated by elastic backscatter of low energy protons. The variations of isotope ratios in two trees have been measured and the correlation with historic weather records is being studied. (Author)

AD-757 299 Reprint
Arizona Univ Tucson Inst of Atmospheric Physics
DETERMINATION OF AEROSOL HEIGHT DISTRIBUTIONS BY LIDAR,
Frederick G. Fernald, Benjamin M. Herman, and John A. Reagan. 30 Nov 71, 8p Rept no. Reprint-288
Contract N00014-67-A-0209-0009, Grant NSF-GA-16764
Sponsored in part by Grants NSF-GA-1431, NSF-GA-24134. Revision of report dated 9 Jul 71.
Availability: Pub. in Jnl. of Applied Meteorology, v11 n3 p482-489 Apr 72.

Descriptors: (*Atmospheric sounding, Aerosols), Height finding, Opdar, Scattering, Mathematical models, Wind, Atmospheric temperature, Arizona.
Identifiers: Remote sensing, Tucson (Arizona).

A new analytic solution to the lidar equation is presented, which realistically considers the scattering properties of the aerosols and the molecular atmosphere individually. With this solution, it is shown, in turbid atmospheres where the aerosols dominate the scattering properties, that accurate vertical profiles of the volume extinction cross section can be obtained with an uncalibrated lidar, provided that the total transmittance of the atmospheric layer being investigated is known. This solution is applied to data samples collected under very clear and under very dusty conditions. (Author)

AD-757 328 PC$3.00/MF$0.95
Environmental Prediction Research Facility (Navy) Monterey Calif
A STUDY OF NUMERICAL SIMULATION OF MARITIME FOG,
David M. Feit. Dec 72, 46p Rept no. ENVPREDRSCHFAC-tech paper-13-72

Descriptors: (*Fog, Atmosphere models), (*Marine meteorology, Fog), Mathematical models, Sea water, Surface temperatures, Wind, Atmospheric temperature, Barometric pressure, Humidity, Weather forecasting.
Identifiers: Advection.

The paper reports the findings of an investigation into the use of a numerical advection fog model in a maritime environment. Methods of handling the fallout of liquid water and the flux of water vapor and heat are discussed, and the effect of the sea-surface temperature on fog formation is shown in a series of graphs and figures. Also discussed is the importance of wind shear and radiation with relation to the model. Several modifications to the model were tested and are described and the results of five experiments are reported. Conclusions and recommendations derived as a result of this study are presented. (Author)

AD-757 486 PC$3.00/MF$0.95
Arizona Univ Tucson
RECONSTRUCTION OF PAST CLIMATIC VARIABILITY.
Semi-Annual Technical rept. 1 Jul 72-1 Jan 73,
Harold C. Fritts, M. A. Stokes, J. S. Dean, M. A. Wiseman, and C. W. Stockton. 1 Jan 73, 26p
AFOSR-TR-73-0483
Grant AF-AFOSR-2406-72, ARPA Order-2221

Descriptors: (*Climatology, History), Trees, North America, Tables, Multivariate analysis.

Identifiers: *Tree ring analysis, *Paleoclimatology.

New ring-width chronologies are obtained for the purpose of extending the existing climate data base back in time and to a wider geographic area. A total of 139 new sites have been collected and progress on analysis is reported. Compilation of long climatic data is proceeding and multivariate models give increased predictability of climate from tree rings. Expansion of the data base to new areas in North America and Europe is being planned. (Author)

AD-757 487 PC$4.25/MF$0.95
Emmanuel Coll Boston Mass Oriental Science Research Library
ENVIRONMENTAL POLLUTION AND CLIMATIC CHANGE,
Chotaro Nakajima. 9 Jan 73, 44p* Rept nos. Emm-73-282, 73-1 AFCRL-TR-73-0010, AFCRL-Trans-101
Contract F19628-71-C-0121
Trans. of Tenki (Japan) v18 n9 p453-474 1971.

Descriptors: (*Air pollution, *Climatology), Aerosols, Carbon monoxide, Carbon dioxide, Lead, Cooling, Japan, Snow.
Identifiers: *Climatic changes, Translations.

The paper discusses environmental pollution and climatic change. Discussions begin on atmospheric pollution on a global scale, followed by anthropogenic modification of global climage, numerical experiment of climatic change, cooling in the northern hemisphere, environmental influence on the Japan climate, climatic variation related to the mass balance of prennial snow patches, and secular variation of air temperature and humidity in some suburan localities. Finally, the generalities of artificial climate control are presented. (Author)

AD-757 489 PC$3.00/MF$0.95
Air Force Cambridge Research Labs L G Hanscom Field Mass
ON THE OPERATIONAL VALUE OF TERMINAL WEATHER FORECASTS.
Air Force surveys in Geophysics,
C. N. Touart. 12 Dec 72, 12p Rept nos. AFCRL-AFSIG-252, AFCRL-72-0719

Descriptors: (*Weather forecasting, Air Force), Climatology, Ceiling, Visibility, Value engineering.
Identifiers: *Terminal weather forecasting.

Real forecast verifications are used to test a Wx-85 conclusion based on synthetic data: namely, that where the climatic frequency of closed terminal weather is as low as found typically in the CONUS, then the present level of forecasting skill for periods of 3 hours or more is of negative value to aircraft operations. The new results confirm the previous conclusion for longer periods but suggest that it is unduly pessimistic with respect to the 3-hour forecast. (Author)

AD-757 501 PC$3.00/MF$0.95
Eastern Air Lines Inc Miami Fla Engineering Dept
AN INVESTIGATION OF A VERTICALLY SCANNING INFRARED RADIOMETER AS A CLEAR AIR TURBULENCE WARNING SYSTEM.
Final rept. 1 Oct 71-31 Oct 72,
Dale N. Jones. Dec 72, 103p AFCRL-72-0729
Contract F19628-72-C-0086

Descriptors: (*Meteorological instruments, Clear air turbulence), (*Clear air turbulence, Warning systems), Aircraft equipment, Infrared detectors, Radiometers, Aviation safety, Flight testing.
Identifiers: Remote sensing.

Over 350 flight hours were flown on a specially instrumented DC8-61 in regular passenger-carrying service. The aircraft was instrumented with an Infrared Clear Air Turbulence stabilized remote-temperature sensor and a digital recording system. All flights were accomplished with specially trained research observers occupying a cockpit jump-seat making detailed records of atmospheric conditions and significant events. Approximately 200 hours of cruise-level recordings were obtained and analyzed. It was found that all clear air turbulence encountered during cruise-level flight was associated with measurable horizontal temperature gradients. On the other hand, only half of the observed temperature changes were associated with vertical accelerations of +0.1 'g' or greater. The flight records contain meager evidence that clear air turbulence severity may be associated with the magnitude of horizontal temperature change. (Author Modified Abstract)

AD-757 543 PC$3.00/MF$0.95
Environmental Technical Applications Center (Air Force) Washington D C
LISTING OF SEMINARS AVAILABLE AT HQ AWS, AWS WINGS, AND AFGWC.
Technical note.
Mar 73, 37p Rept no. USAFETAC-TN-73-3

Descriptors: (*Weather forecasting, Air Force training), All-weather aviation, Air pollution, Abstracts.

The report furnishes a complete listing of the prepared technical seminars at AWS wing headquarters which are available for loan to all AWS units for local presentation. The listing includes the seminar subject, author (where available), number of copies available, period of loan, approximate presentation time, type of illustrative material, and a brief synopsis of the seminar material. (Author Modified Abstract)

AD-757 623 PC$3.00/MF$0.95
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
NUMERICAL APPROXIMATIONS OF SELECTED METEOROLOGICL PARAMETERS RELATED TO CLOUD PHYSICS.
Research and development technical rept.,
Walter S. Nordquist, Jr. Mar 73, 50p ECOM-5475

Descriptors: (*Meteorological parameters, Numerical analysis), Vapor pressure, Dew point, Specific heat, Clouds, Approximation (Mathematics), Computer programs.
Identifiers: FORTRAN, *Cloud physics, Latent heat, Wet bulb temperature.

Methods of computation and error estimates are presented for numerical approximation of selected meteorological parameters used in the solution of cloud physics problems. These parameters are latent heat, saturation vapor pressure, dew point and wet bulb temperatures, specific heat of liquid water, temperature of the lifting condensation level, change in mass of freely falling water drops, and saturation-adiabatic temperatures. The FORTRAN programming language listings of the approximations are provided in the appendix. (Author)

AD-757 625 PC$3.00/MF$0.95
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
APPARENT 7-DAY PERIOD IN VISIBILITY DATA AT WHITE SANDS MISSILE RANGE, NEW MEXICO.
Technical rept.,
G. S. Rinehart, and R. P. Lee. Apr 73, 18p ECOM-5484

Descriptors: (*Visibility, Guided missile ranges), New Mexico, Time series analysis, Meteorological parameters.
Identifiers: White Sands (New Mexico).

A success-failure time series analysis was carried out on 3653 data points derived from 10 years of meteorological data acquired at White Sands Missile Range revealing a 7-day period in daytime visibility data. A success was classified as a day during which two consecutive visibility observations were recorded, and the surface wind speed was less than 5 m/sec for at least 12 hours prior to the visibility observation, and the relative humidity was less than 50%. These criteria were employed to minimize the influence of dust generated by locally high winds, and to reduce the influence of relative humidity in increasing atmospheric particulate concentration or size. (Author Modified Abstract)

COM-73-10334 PC$3.00/MF$0.95
Washington State Univ., Pullman. Cooperative Extension Service.
WASHINGTON CLIMATE FOR THESE COUNTIES: CLALLAM, GRAYS HARBOR, JEFFERSON, PACIFIC AND WAHKIAKUM,
Earl L. Phillips, and Wallace R. Donaldson. Dec 72, 91p EM-3708 NOAA-73020502
Prepared in cooperation with National Weather Service, Seattle, Wash.

Descriptors: (*Climate, Washington), Coasts, Meteorological data, Tables (Data).
Identifiers: Clallam County (Washington), Grays Harbor County (Washington), Jefferson County (Washington), Pacific County (Washington), Wahkiakum County (Washington).

Statistical data is presented on the climate of Clallam, Grays Harbor, Jefferson, Pacific and Wahkiakum Counties in Washington State.

JPRS-58346 PC$3.00/MF$0.95
Joint Publicatons Research Service, Arlington, Va.
LASERS AND METEOROLOGY,
V. M. Zakharov, and O. K. Kostro. 28 Feb 73, 81p Trans. of mono. Lazery i Meteorologiya, Leningrad, 1972 61p.

Descriptors: (*Meteorological instruments, Lasers), Remote sensing, Atmospheric physics, Cloud physics, Atmospheric composition, Optical properties, Light scattering, Laser beams, Translations, USSR.

Contents:
- Measurement of Standard Meteorological Parameters of the Atmosphere;
- Determination of Certain Parameters of the Clouds;
- Determination of the Transparency of the Atmosphere;
- Determination of the Composition of the Atmosphere;
- Prospects of the Use of Lasers in Meteorology.

N73-16244 PC$3.00/MF$0.95
Tennessee Univ. Space Inst., Tullahoma.
A BOUNDARY LAYER APPROACH TO THE ANALYSIS OF ATMOSPHERIC MOTION OVER A SURFACE OBSTRUCTION.
Contract Report, 3 Jun. 1971 - 2 Sep. 1972
W. Frost, J. R. Maus, and W. R. Simpson. Jan 73, 153p NASA-CR-2182, M109
Contract NAS8-27387

Descriptors: *Atmospheric circulation, *Boundary layers, *Ground wind, *Surface roughness, Flow distribution, Mathematical models, Reynolds number, Wind profiles.

For abstract, see STAR 11 07.

N73-16603 PC$3.00/MF$0.95
Finnish Meteorological Inst., Helsinki.
THE RELATIONSHIP BETWEEN VERTICAL VELOCITY IN A BAROCLINIC MODEL AND THE OCCURRENCE OF RAIN AND CLOUDS IN FINLAND.
H. Savijaervi. Jul 72, 19p TR-4

Descriptors: *Atmospheric models, *Finland, *Numerical weather forecasting, Clouds (meteorology), Meteorological parameters, Rain.

For abstract, see STAR 11 07.

N73-16605 PC$3.00/MF$0.95
Texas A+m Univ., College Station.
AN INVESTIGATION OF THE SUTCLIFFE DEVELOPMENT THEORY.
J. D. Dushan. Jan 73, 76p NASA-CR-2192, M107
Contract NAS8-26751

Descriptors: *Anticyclones, *Cyclones, *Numerical weather forecasting, Computer programming, Mathematical models, Synoptic meteorology.

For abstract, see STAR 11 07.

N73-16609 PC$4.25/MF$0.95
Institut Royal Meteorologique de Belgique, Brussels.
AEROLOGICAL CLIMATOLOGY UCCLE STATION (06447) . CLIMATOLOGIE AEROLOGIQUE STATION DUCCLE (06447).
P. Defrise, R. Sneyers, W. Struylaert, and J. Vanisacker. 1972, 45p PUBL-SER-A-77
Language French English Summary

Descriptors: *Aerology, *Belgium, *Climatology, *Weather stations, Free atmosphere, Meteorological parameters, Periodic variations, Statistical analysis.

For abstract, see STAR 11 07.

N73-16610 PC$5.50/MF$0.95
France. Direction de La Meteorologie Nationale, Paris.
THE CLIMATE OF MARTINIQUE . LE CLIMAT DE MARTINIQUE.
M. Perrusset, and S. Selbonne. Oct 72, 68p
MONO-86
Language French

Descriptors: *Climate, *Martinique, *Periodic variations, Atmospheric circulation, Climatology, Cyclones, Meteorological parameters, Satellite observation, Statistical analysis, Tropical storms, Weather stations.

For abstract, see STAR 11 07.

N73-16611 PC$7.75/MF$0.95
Deutsche Forschungs- Und Versuchsanstalt Fuer Luft- Und Raumfahrt, Oberpfaffenhofen (West Germany). Inst. Fuer Physik Der Atmosphaere.
CLOUD TEMPERATURE AND HEIGHT MEASUREMENTS USING RADIOSONDE AND LIDAR . WOLKENTEMPERATUR-UND WOLKENHOEHENMESSUNG MIT RADIOMETER UND LIDAR.
C. Werner. 1972, 111p BMVG-FBWT-72-17
Subm- Sponsored By Bundesmin. Fuer Verteidigung

Descriptors: *Clouds (meteorology), *Infrared detectors, *Temperature measurement, Altitude, Cloud cover, Optical radar, Radiosondes.

For abstract, see STAR 11 07.

PB-216 061/2 PC$3.00/MF$0.95
Colorado State Univ., Fort Collins. Dept. of Atmospheric Science.
INTERPRETING OROGRAPHIC SNOWFALL PATTERNS,
J. Owen Rhea. Jan 73, 74p AS-Paper-197
Prepared in cooperation with EG and G, Inc., Bedford, Mass., under Contract DI-14-06-D-6963.

Descriptors: (*Snowfall, Physical geography), Mountains, Colorado, Statistical distributions, Correlation techniques, Regression analysis, Wind (Meteorology), Weather forecasting.

Winter precipitation in mountainous southwest Colorado was related to terrain slope and elevation by multiple regression. From a 12 season record of 15 daily precipitation stations, the study used only those days with > or ± .01 in. at > or ± one station. Days used were classed by mean 24 hour 700 mb wind direction and speed. By class, each station's mean 24 hour precipitation was computed as was station slope over 8 distances. These precipitation values were correlated to elevation and to products of terrain slope x 700 mb wind speed x 700 mb mean saturation mixing ratio lapse rate. (Products are simplified factors in an orographic precipitation formula). Multiple correlation coefficient ranged between 0.80 and 0.98 for both speed and direction constant and was 0.68 for both variable. For each of two test years, correlation between computed and observed seasonal precipitation was > or ± 0.92. Technique refinement into a short term predictor seems feasible. (Author Modified Abstract)

PB-216 418/4 PC$3.00/MF$0.95
Colorado State Univ., Fort Collins. Dept. of Atmospheric Science.
CYCLONES AND THE ATMOSPHERIC WATER CYCLE, A SURVEY OF RESEARCH OBJECTIVES,
Herbert Riehl, and James L. Rasmussen. Mar 72, 26p* AS-Paper-183

Descriptors: (*Cyclones, Precipitation (Meteorology)), Atmospheric condensation, Weather modification, Cloud seeding, Tropical cyclones, Atmospheric models.

The report summarizes research focused on the problem of the water balance and precipitation regimes of extratropical and tropical cyclones. The study centers on the treatment of the cyclone in a moving reference frame so that the system is isolated from the larger scale atmospheric motion field. The extratropical cyclone analysis is based on the evaluation of the net inflow and change of storage of water vapor in the atmospheric volume encompassing the storm. The analysis leads to an estimate of precipitation, neglecting ground evaporation, which is compared to the observed precipitation. The observed precipitation following the moving storm center is obtained from hourly precipitation data. The precipitation regime that evolves is one of highly localized precipitation, even in winter time extratropical cyclones, with the precipitation areas moving within the frame of reference. An analysis of the distribution of precipitation in space and time for raingauges moving through the storm system is presented for both summer and winter cases. Finally, the rule of condensate formation is determined from the mass inflow within the cyclone system. (Author Modified Abstract)

PB-216 976/1 PC$3.00/MF$0.95
Colorado State Univ., Fort Collins. Dept. of Atmospheric Science.
A CASE STUDY OF THE WATER BUDGET OF AN OROGRAPHIC CLOUD,
L. K. Balik, and J. L. Rasmussen. May 72, 48p AS-Paper-187 REC-14-06-D-6467
Contract DI-14-06-D-6467

Descriptors: (*Clouds (Meteorology), Hydrometeorology), (*Precipitation (Meteorology), Mountains), Atmospheric condensation, Water balance, Cloud seeding, Cloud physics, Weather modification, Winter, Colorado.

An analysis of a precipitating wintertime orographic cloud system is presented. The analysis consists of a study of air parcel trajectories, cloud dimensions and character, and an evaluation of the atmospheric water budget leading to an estimate of condensation rate, precipitation rate and efficiency. The analysis is based upon radiosonde observations taken at three locations along a line intersecting the Continental Divide near Leadville, Colorado. The results show that reasonable estimates of the precipitation, cloud efficiency and air parcel trajectories are determined. Evaluation is based upon general sky conditions, radar observations, and snow board measurements. Suggestions to improve such computations are made. (Author)

5. BEHAVIORAL AND SOCIAL SCIENCES

5A. Administration and Management

AD-757 184 PC$3.00/MF$0.95
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
MANAGEMENT: THE PLANNING PROCESS,
James L. Quinn. Jan 72, 44p Rept no. AU-AFIT-SL-2-72

Descriptors: (*Management planning, Reviews), Operation, Decision making, Classification, Linear programming, Advanced planning.
Identifiers: Objectives, Nonrepetitive actions, Repetitive actions.

The report is one of a series of monographs relating to the system of management. The process of planning is discussed as one of the elements of the management system in which all the elements are intricately related with each other. The system is viewed in terms of a three-dimensional model. Included are the following topics: System of management; the process and functions of planning; need and concepts; types of plans, including goals and objectives, non-repetitive actions, and repetitive actions. (Author Modified Abstract)

AD-757 185 PC$3.00/MF$0.95
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
MANAGEMENT: THE ORGANIZING PROCESS.
Doctoral thesis,
Alan J. Goldstein. Jan 72, 52p Rept no. AU-AFIT-SL-3-72

Descriptors: (*Management planning, Reviews), Systems engineering, Decision making, Theory, Leadership, Control, Communication systems, Mathematical models, Theses.
Identifiers: *Organizing, Objectives, Policies.

The report is one of a series of monographs relating to the system of management. The process of organizing is discussed as one of the elements of the management system in which all the factors are intricately related with each other. The system is viewed in terms of a three-dimensional model in which one dimension consists of the functions of establishing objectives, formulating policies, and making decisions; a second dimension is comprised of the traditional management processes of planning, organizing, directing, and controlling; and the third dimension represents the bonds of communication tying together all the other elements of the management system. (Author Modified Abstract)

AD-757 186 PC$3.00/MF$0.95
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
MANAGEMENT: THE CONTROLLING PROCESS,
James L. Quinn. Jan 72, 48p Rept no. AU-AFIT-SL-5-72
See also AD-757 187 and AD-757 188.

Descriptors: (*Management control systems, Theory), Decision making, Quality control, Organizations, Inventory control, Personnel management, Data processing systems, Standards.
Identifiers: Management information systems, Policy making, Organization theory, Management.

The report is one of a series of monographs relating to the system of management. In the monograph the process of controlling is discussed as one of the elements of the management system in which all the elements are intricately related with each other. The system is viewed in terms of a three-dimensional model in which one dimension consists of the functions of establishing objectives, formulating policies, and making decisions; with the second dimension being comprised of the traditional management processes of planning, organizing, directing, and controlling; and with the third dimension representing the bonds of communication tying together all the other elements of the management system. (Author Modified Abstract)

AD-757 187 PC$3.00/MF$0.95
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
MANAGEMENT: DECISION-MAKING,
James L. Quinn. Jan 72, 24p Rept no. AU-AFIT-SL-6-72
See also AD-757 186 and AD-757 188.

Descriptors: (*Management planning, *Decision making), Organizations, Problem solving, Statistical analysis, Theory.
Identifiers: Management information systems, Organization theory, Policy making, Management.

The report is one of a series of monographs relating to the system of management. In the monograph the decision-making process is discussed as one of the elements of the management system in which all the elements are intricately related with each other. The system is viewed in terms of a three-dimensional model in which one dimension consists of the functions of establishing objectives, formulating policies, and making decisions; with the second dimension being comprised of the traditional management processes of planning, organizing, directing, and controlling; and with the third dimension representing the bonds of communication tying together all the other elements of the management system. (Author Modified Abstract)

AD-757 188 PC$3.00/MF$0.95
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
MANAGEMENT: COMMUNICATING,
James L. Quinn. Jan 72, 43p Rept no. AU-AFIT-SL-7-72
See also AD-757 186 and AD-757 187.

Descriptors: (*Management planning, Social communication), Organizations, Decision making, Information theory, Behavior, Industrial relations, Theory.
Identifiers: Management information systems, Policy making, Organization theory, *Communicating, Management.

The report is one of a series of monographs relating to the system of management. In the monograph the process of communicating is discussed as one of the elements of the management system in which all the elements are intricately related with each other. The system is viewed in terms of a three-dimensional model in which one dimension consists of the functions of establishing objectives, formulating policies, and making decisions; with the second dimension being comprised of the traditional management processes of planning, organizing, directing, and controlling; and with the third dimension representing the bonds of communication tying together all the other elements of the management system. (Author Modified System)

JPRS-58228 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
FIELD OF USSR AND U. S. MANAGEMENT SCIENCE SURVEYED,
Fedor Burlatskii. 14 Feb 73, 46p
Trans. of Novyi Mir (USSR) n7 p146-175 Jul 72.

Descriptors: (*Management systems, USSR), (*Management methods, United States), Reviews, Control, Transformations, Electronic computers, Objectives, Sociometrics, Trends, Translations.
Identifiers: Management information systems.

The report contains a discussion of Soviet and American systems of control in management, organization and administration. The scientific-technical revolution, the growing area of systems analyses with its practical application, and the use of computers are discussed at length. (Author)

5B. Documentation and Information Technology

AD-757 041 PC$3.00/MF$0.95
Hawaii Univ Honolulu Dept of Political Science
QUARTERLY TECHNICAL REPORT NO. 19, OCTOBER 1, 1972 - DECEMBER 31, 1972.
Research rept.,
R. J. Rummel. Jan 72, 8p
Contract N00014-67-A-0387-0003, ARPA Order-1063
Report on The Dimensionality of Nations Project.
See also AD-757 040.

Descriptors: (*Naval research, Reports), Social sciences, Behavior, Data processing systems, Programming (Computers), Factor analysis, Perception, Asia.
Identifiers: Metaphysics, Cognition, Dimensionality of nations project, International relations.

During the quarter, factor analyses for both the attribute data and the behavioral-space data were completed. (Author)

AD-757 092 PC$4.85/MF$0.95
Honeywell Information Systems Inc Waltham Mass Advanced Systems and Technology Operation
DATA BASE SYSTEMS RESEARCH.
Annual technical rept.,
David K. Hsiao. 1 Dec 72, 79p* Rept no. ASTOW-73-26
Contract N00014-72-C-0391

Descriptors: (*Data processing systems, *Information retrieval), Algorithms, Mathematical logic, Programming languages, Search theory, Decoding, Artificial intelligence.
Identifiers: *Data bases, *File structures, PL/1 programming language, Boolean functions, Records management.

The report discusses the following topics: A model for keyword based file structures, access and update; Selection of file structure for intended applications; Automatic selection and generation of 'optimal' file structure on the basis of the allowable queries and intended use; Network and hierarchy file structures; A view of directed graph; and Report generation and record reorganization.

AD-757 261 PC$3.00/MF$0.95
Office of Naval Research London (England)
TRENDS IN PHYSICS: A REPORT ON THE GENERAL CONFERENCE OF THE EUROPEAN PHYSICAL SOCIETY (2ND), WIESBADEN, 3-6 OCTOBER 1972.
Conference rept.,
I. Estermann. 14 Feb 73, 13p Rept no. ONRL-C-21-72

Descriptors: (*Physics, Symposia), Muons, Cryogenics, Superconductivity, Lasers, Astrophysics, Solid state physics, West Germany, Great Britain.

The Second General Conference of the European Physical Society took place in Wiesbaden, Germany, from 3 to 6 October 1972. The theme of the Conference was announced as 'Trends in Physics,' but very prominent among the discussions was the relationship between Physics and Society. The program consisted of nine plenary sessions which are reported in detail in the following pages, and fifteen divisional sessions - always five in parallel - distributed over three afternoons, at which subjects more limited in scope were presented. (Author Modified Abstract)

AD-757 369 PC$3.00/MF$0.95
Office of Naval Research London (England)
EUROPEAN SCIENTIFIC NOTES. VOLUME 27, NUMBER 2,
James T. Lester, and Victoria Hewitson. 28 Feb 73, 27p Rept no. ESN-27-2
See also AD-755 186.

Descriptors: (*Naval research, Europe), Periodicals, Reviews, Psychology, Biology, Oceanology, Engineering, Materials, Medicine.

The monthly publication presents brief articles concerning recent developments in European scientific research. It is hoped that these articles (which do not constitute part of the scientific literature) may prove of value to American scientists by disclosing interesting information well in advance of the usual scientific publications. The articles are written by members of the scientific staff of ONRL, with an occasional article contributed by a visiting stateside scientist. (Author)

AD-757 567 PC$6.00/MF$0.95
Massachusetts Inst of Tech Cambridge Research Lab of Electronics
QUARTERLY PROGRESS REPORT NO. 108,
H. J. Zimmermann, G. G. Harvey, and S. J. Mason. 15 Jan 73, 368p
Contract DAAB07-71-C-0300
See also Quarterly progress rept. no. 107, AD-751 213.

Descriptors: (*Physics, Scientific research), (*Plasma medium, Reports), (*Communication systems, Scientific research), Molecular beams, Microwaves, Atomic properties, Radio astronomy, Electronics, Acoustics, Lasers, Information theory, Nervous system, Speech, Detection, Linguistics.
Identifiers: Signal processing, Cognition.

The report contains a review of the research activities of the Laboratory for the three-month period ending November 30, 1972. Since this is a report on work in progress, some of the results may not be final. The report of each research group is prefaced with a statement of the objectives of the group. These summaries of aims are presented in an effort to give perspective to the detailed reports. (Author Modified Abstract)

AD-757 627 PC$3.00/MF$0.95
Army Construction Engineering Research Lab Champaign Ill
INITIAL REPORT ON SYSTEMIZING INFORMATION TO IDENTIFY AND RELATE BEHAVIORAL AND PHYSICAL DESIGN PARAMETERS.
Preliminary rept.,
David L. Dressel, and Roger L. Brauer. Mar 73, 8p Rept no. CERL-PR-D-4
Report on Identification and classification of Human heeds in the military facility.

Descriptors: (*Information retrieval, Human engineering), (*Human engineering, Military facilities), Buildings, Design, Behavior, Computers.
Identifiers: *Information systems, *Computer aided architecture.

The preliminary report summarizes progress to date on development of an information system to service the identification and classification of human needs in the military facility. The system will be used to develop information for design

decisions. At present, behavioral and design theories have been reviewed, and have played an important part in formulating the pilot information system. The system is responsive to the requirements of both the researcher and the designer, with data categorized and translated through the 'relationship sentence.' Amenable to computer input, storage and data retrieval, the relationship sentence is a statement of relation between constraints, user activities, and physical characteristics. The structure of the relationship sentence is thought to be complete enoughfor easy gathering of data from existing studies, yet sufficiently flexible to allow categorization of behavioral data in varying degrees of explicitness. The output from the system is intended to be compatible with developing computer-aided design programs, if not an integral part of such program. Discussed in this report is the structure and function of the information system, its relation to information science and computer-aided architecture, and work required for its further development. (Author)

AD-757 651 PC$3.00/MF$0.95
Office of Naval Research London (England)
DIRECTORY OF EUROPEAN LOW TEMPERATURE RESEARCH,
E. A. Edelsack, R. Kropschot, N. A. Olien, and J. L. Olsen. 26 Feb 73, 43p Rept no. ONRL-D-16-73

Descriptors: (*Low-temperature research, Directories), (*Cryogenics, Scientific research), Superconductivity, Solid state physics, Europe, Great Britain.

The Directory contains the names of over 300 persons in some 125 laboratories in 18 European countries who are engaged in low temperature research. Mailing address, telephone number and a brief description of the individual's research interest are included. (Author)

AD-757 652 PC$3.00/MF$0.95
Office of Naval Research London (England)
FOUR MEDICAL SCHOOLS AND A RESEARCH CENTER IN SCOTLAND,
Arthur W. Frisch. 28 Dec 72, 39p Rept no. ONRL-R-20-72

Descriptors: (*Naval research, Reports), Universities, Medicine, Surgery, Laboratories, Pressure vessels, Instructors, Physiology, Medical research, Pathology, Immunology, Microbiology, Nutrition, Great Britain.
Identifiers: Hyperbaric oxygen chambers.

Contents:
- Aberdeen University Medical School (Bacteriology, Surgery);
- Rowett Research Institute, Bucksburn, Aberdeen;
- Dundee University Medical School (Bacteriology, Pathology, Surgery);
- Glasgow University Medical School (Bacteriology and Immunology, Virology at Belvidere Hospital);
- Edinburgh University Medical School (Bacteriology, Pathology).

AD-757 669 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
DEVELOPMENT OF A COMPUTER BASED MANAGEMENT INFORMATION SYSTEM.
Master's thesis,
John David Cicio. Dec 72, 76p

Descriptors: (*Information retrieval, *Management engineering), Data processing systems, Design, Decision making, Theses.
Identifiers: *Management information systems.

Management information is of critical importance in modern decision making. The role of the computer in this process is rapidly expanding, creating challenging goals for data processing specialists and functional area specialists alike. A totally integrated computer based management information system requires long term planning and design effort coupled with detailed analysis of information system requirements. The paper suggests a new relationship between the time value of information and management decision making. (Author)

COM-73-50186-02 PC-GPO/MF$0.95-NTIS
National Bureau of Standards, Washington, D.C.
TECHNICAL NEWS BULLETIN. VOLUME 57, NUMBER 2, FEBRUARY 1973.
Monthly rept.
Feb 73, 28p NBS-TNB-57/2
Library of Congress Catalog Card no. 25-26527.
Paper copy available from GPO $6.50/year as C13.13:57, $0.65/copy as C13.13:57/2.

Descriptors: (*Periodicals, Research projects), Malignant neoplasms, Diagnosis, Nuclear magnetic resonance, Urban planning, Game theory, Temperature measurement, Trucks, Noise (Sound), Metric system, Conversion, Incinerators, Standards.
Identifiers: Technical news bulletins, National Bureau of Standards.

The monthly magazine contains short summaries of major technical developments; special columns on the National Standard Reference Data System, Federal Information Processing Standards, Standards and Calibration, etc; major speeches and statements by Bureau management; and a listing of all NBS publications. The table of contents for the current issue is: Cancer detected in living animals using nuclear magnetic resonance; City games people play; NBS measurements show significant temperature scale differences; Optical radiation news; The Metric System-a changeover is under way; Brief history of measurement systems with a chart of the modernized Metric System; NBS helps with problems of waste incineration; NSRDS news; OIML meeting; Publications of the National Bureau of Standards. (Author)

COM-73-50186-03 PC-GPO/MF$0.95-NTIS
National Bureau of Standards, Washington, D.C.
TECHNICAL NEWS BULLETIN. VOLUME 57, NUMBER 3, MARCH 1973.
Monthly rept.
Mar 73, 25p NBS-TNB-57/3
Library of Congress Catalog card no. 25-26527.
Paper copy available from GPO $6.50/year as C13.13:57, $0.65/copy as C13.13:57/3.

Descriptors: (*Periodicals, Research projects), Electron irradiation, Recombination reactions, Ovens, Stoves, Electrical engineering, Standards, X ray apparatus, Railroads.
Identifiers: National Bureau of Standards, Technical News Bulletins.

Contents:
- Electron Recombination Reactions;
- New NBS Director-Dr. Richard W. Roberts;
- New Oven Constrains Corrosive Vapors;
- Lower Temperatures Recommended for Ranges;
- Electrical Engineering Units and Constants Cards;
- Performance Standards for X-Ray Systems;
- NBS Aids U.S. Railroad System;
- NSRDS News;
- All You Will Need to Know About Metric;
- New Reference Tables for Low-Temperature Thermocouples Available;
- Using Tribo-Ellipsometry to Study Stress Corrosion Cracking;
- Standard Reference Material for Analyzing Lead-Based Paints Available;
- TV Time Petitions Sent to FCC;
- Publications of the National Bureau of Standards.

INR-1399 PC$3.00/MF$0.95
Institute Of Nuclear Research, Warsaw (Poland).
LIST OF PUBLICATIONS OF THE INSTITUTE OF NUCLEAR RESEARCH, ZERAN CENTRE IN THE YEARS 1965 TO 1970.
1972, 100p
Lang- In English And Polish. U. S. Sales only

Descriptors: *Nuclear physics.

For abstract, see NSA 27 06, number 14382.

JPRS-58219 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
REFERENCE AID: ABBREVIATIONS IN THE CAMBODIAN AND LAO PRESS.
13 Feb 73, 53p
Supersedes Rept. no. JPRS-47539.

Descriptors: (*Abbreviations, *Cambodia), (*Laos, Abbreviations).

The report consists of a selective list of abbreviations found in the Cambodian and Lao press.

JPRS-58239 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
CONTEMPORARY BIOGRAPHIES FROM THE LARGE SOVIET ENCYCLOPEDIA, VOLUME 8,
A. M. Prokhorov. 15 Feb 73, 59p
Trans. of Bolshaya Sovetskaya Entsiklopediya (USSR) v8 600p 1972.

Descriptors: (*Biographies, Scientists), (*Scientists, USSR), Social sciences, Political science, Law (Jurisprudence), Economics, Humanities, Chemistry.

The report contains biographical articles on living Soviet personalities included in the Large Soviet Encyclopedia. The information has been reproduced in file-card format for convenience in filing. (Author)

NP-19424 PC$3.00/MF$0.95
Stichting Voor Fundamenteel Onderzoek Der Materie, Utrecht (Netherlands). Stichting Instituut Voor Kernphysisch Onderzoek, Amsterdam (Netherlands).
1971 ANNUAL REPORT.
1971, 219p
Lang- In Dutch. U. S. Sales only

Descriptors: *Alloys, *Atomic physics, *Crystals, *Gases, *Nucleons, *Plasma, *Solid state physics, *Tokamak devices.

For abstract, see NSA 27 06, number 12964.

N73-16218 PC$3.50/MF$0.95
System Development Corp., Santa Monica, Calif.
IMPROVEMENTS TO INFORMATION MANAGEMENT SYSTEMS SIMULATOR.
Final Report
R. W. Bilek. 10 Nov 72, 30p NASA-CR-128718, TM-5019
Contract NAS9-12871

Descriptors: *Computerized simulation, *Information management, *Mathematical models, Computer programming, Cost effectiveness, Management systems.

For abstract, see STAR 11 07.

N73-16950 PC$17.25/MF$0.95
Istituto Universitario Navale, Naples (Italy). Ist. Di Meteorologia E Oceanografia.
SELECTED PAPERS ON OCEANOGRAPHY, METEOROLOGY, GEOPHYSICS, AND ATMOSPHERICS CARRIED OUT BY MEMBERS OF THE INSTITUTE OF METEOROLOGY AND

OCEANOGRAPHY IN HONOR OF PROF. GIUSEPPIA ALIVERTI.
Jun 72, 301p
Languagertly in English Partly in French and Partly in Italian

Descriptors: *Geophysics, *Hydrometeorology, *Navigation, *Oceanography, Atmospheric composition, Earth resources, Italy, Positron annihilation.

For abstract, see STAR 11 07.

PB-216 334/3 PC$3.00/MF$0.95
George Washington Univ., Washington, D. C. Biological Sciences Communication Project.
INFORMATION-EXCHANGE PROGRAM FOR REHABILITATION RESEARCH AND TRAINING CENTERS. A FEASIBILITY STUDY.
Final rept.,
Bruce Berman, and Irvin C. Mohler. 1971, 79p
SRS-RD-3714
Grant SRS-RD-3714

Descriptors: (*Information systems, *Rehabilitation), (*Specialized training, Information systems), Centers, Feasibility, Research, Information retrieval.
Identifiers: Management information systems.

The Biological Sciences Communication Project of George Washington University attempted to assess the feasibility of developing an information-exchange program and clearinghouse to (1) assist the exchange of information between research and training centers, regional offices, and state agencies, and (2) provide a centralized data source which could provide an adequate basis for the administration and guidance of the various centers. One hundred annual reports were selected, abstracted and indexed, and directories of their content prepared and distributed to 111 recipients. A newsletter, prepared with two alternative kinds of content, was distributed with the directories of research and training. Questionnaires were used to elicit response concerning utility of each of the four publications. It was concluded that the data derived from the user evaluation supported the feasibility and desirability of establishing an information-exchange program along the lines investigated by the study.

PB-218 036/2 PC$3.00/MF$0.95
Naval Research Lab., Washington, D.C.
REPORT OF NRL PROGRESS.
Progress rept.
Jan 73, 55p

Descriptors: (*Naval research, Abstracts), Chemistry, Lasers, Acoustics, Electricity, Information systems, Radar, Solid state physics, Metallurgy.

Contents: Lasers in Chemistry; Acoustics; Electricity; Information systems; Metallurgy; Radar; Solid State Physics.

TT-70-55104/7-8 PC$3.00
Atomic Energy Commission, Washington, D.C.
NUKLEONIKA. VOLUME 16, NUMBERS 7-8 1971.
1972, 82p AEC-tr-7223/7-8
Trans. of Nukleonika (Poland) v16 n7-8 p311-398 1971. The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Nuclear chemistry, *Periodicals), (*Poland, Nuclear chemistry), Dosimeters, Complex compounds, Uranium inorganic compounds, Membranes, Free radicals, Radiolysis, Nuclear fuels, Tracer studies, Sewage treatment, Translations.

Contents:
Energy loss distribution of electrons from 204Tl absorbed in silicon;
The composition of uranium (VI) complexes sorbed on an anion-exchange resin from sulfate solutions;
Coefficients of tracer transfer through membranes;
Changes in pH of the NaCl isotonic solutions in heating;
Ionic reactions leading to the formation of methyl radicals in gamma irradiated gaseous ethylene;
Application of the self-absorption of the Cerenkov light to the investigation of kinetics of intermediates in pulse radiolysis;
Scintillation yield of eugenol and methyleugenol in xylene and toluene;
Studies of epithermal cell parameters in the reactor lattices with multitube enriched fuel;
The fuel balance in the nuclear power system based on the fast reactors started up with 235U;
Application of the radiotracer method for studying of purification industrial sewage.

5C. Economics

AD-757 100 PC$3.00/MF$0.95
Harvard Univ Cambridge Mass
GENERAL ECONOMIC EQUILIBRIUM: PURPOSE, ANALYTIC TECHNIQUES, COLLECTIVE CHOICE.
Technical rept.,
Kenneth J. Arrow. Jan 73, 53p Rept no. TR-12
Contract N00014-67-A-0298-0019
Report on Project on Efficiency of Decision Making in Economic Systems.

Descriptors: (*Economics, Equilibrium), Theory, Factor analysis, Commerce, Reviews, Mathematical models, Uncertainty, Decision making.
Identifiers: Objectives, Economic analysis.

The lecture is designed to survey modern development of the theory of general equilibrium in a competitive economy and its role in the allocation of resources. A survey is given of the state of the theory as developed by J.R. Hicks, P.A. Samuelson, and their predecessors as of about 1945, followed by an evaluation of the needs for further development. The differing general equilibrium tradition in the German-language literature is summarized. (Author Modified Abstract)

AD-757 420 PC$3.00/MF$0.95
Harvard Univ Cambridge Mass
EXTERNALITIES IN CENTRALIZED AND DECENTRALIZED ECONOMIES.
Technical rept.,
Aaron J. Douglas. Mar 73, 38p Rept no. TR-13
Contract N00014-67-A-0298-0019
Report on Project on Efficiency of Decision Making in Economic Systems.

Descriptors: (*Economics, Reviews), Money, Management planning, Decision making, Interactions, Efficiency, Systems engineering.
Identifiers: *Benefit cost analysis, *Centralized economies, *Decentralized economies, *Economic models.

The paper is concerned with the role of the rate of return on capital in aggregate and disaggregative dynamic models. Both models illustrate the use of intertemporal analysis in fiscal models. Many issues are skirted which are of central relevance to cost-benefit analysis, but the paper attempts to illustrate how important the role of the rate of return on capital is in almost all such discussions, particularly regional cost-benefit projects. The interdependence between private inputs and public inputs for local industries and projects is defined and studied at length in the second half of the paper, and contrasted with the utility maximization approach of the first half. (Author Modified Abstract)

COM-72-50586-04 PC-GPO/MF$0.95-NTIS
Bureau of International Commerce, Washington, D.C. Office of Export Control.
EXPORT CONTROL. QUARTERLY REPORT (102ND), 4TH QUARTER 1972.
15 Feb 73, 79p BIC-OEC-102
Paper copy available from GPO $0.65 as C1.26:102.

Descriptors: (*International trade, Control), Reviews, Policies, Management, Licenses, Commerce, Statistical data, Eastern Europe, Asia, China, Regulations.
Identifiers: *Export control, Commodity data.

The Office of Export Control makes a quarterly report of its operations. Included are developments in policy and administration, details on licenses issued in the quarter, and a comprehensive trade list of U.S. imports and exports with Eastern Europe, U.S.S.R., and the People's Republic of China during the previous quarter. An extensive revision of the commodity control List is stated in detail.

COM-72-51083 PC-GPO/MF$0.95-NTIS
Gaither International Inc., Stamford, Conn.
A STUDY OF JAPANESE TRAVEL HABITS AND PATTERNS. VOLUME I,
Karol Gess. Oct 72, 92p
Paper copy available from GPO $1.50 as C47.2:J27/vol-1.

Descriptors: (*Travel, *Market research), (*Japan, Travel), Hawaii, Guam, Economic forecasting, United States, Budgeting.
Identifiers: *Tourism.

Japan is in the midst of a veritable travel explosion of substantial proportions, with strong indications that this is merely a prelude to a projected quadrupling of foreign expenditures over the five-year period from 1970 to 1975. The Japanese overseas travel market has so far developed few, if any lines of traditional or favored destinations; to some extent, the urge to travel is at least as important as the desire to travel to a specific destination. There are, however, certain preference patterns which have already developed, notably Hawaii's popularity with the youth market and Guam's special place in the low-cost honeymoon market segment (in which Hawaii is a close competitor). Europe is the number one competitive destination with the U.S. mainland. Not only does the Japanese market offer maximum opportunity for the further development of travel to the United States, but the commercial and organizational infrastructure is there to aid and to support that development.

COM-73-10381 PC$3.00/MF$0.95
State Planning Office, Santa Fe, N. Mex.
NEW MEXICO STATE DEVELOPMENT PLANNING FOR THE FOUR CORNERS REGIONAL COMMISSION.
Annual technical rept. no. 2,
Keith M. Dotson. Mar 71, 70p FCRC-TA-301-900-018

Descriptors: (*Economic development, *New Mexico), Regional planning, Economic factors, Sociology, Mapping, Recommendations, Education, Coal, Natural gas, Uranium, State government.

In accordance with an Agreement entered into on September 8, 1969 with the Four Corners Regional Commission, the New Mexico State Planning Office agreed to perform five major work elements during the 1969-70 fiscal year and to prepare a final report. This document, which is the final report for the years activities, briefly summarizes the accomplishmeats of the State Planning Office in fulfilling its obligations under this agreement. The report presents the Address of Governor Bruce King to the Thirtieth Legislature, First Session as the Goals, Objectives and Policy Statement of Governor King's administration. (Author)

COM-73-50115-02 PC-GPO/MF$0.95-NTIS
Bureau of Economic Analysis, Washington, D.C.
SURVEY OF CURRENT BUSINESS. VOLUME 53, NUMBER 2, FEBRUARY 1973.
Monthly periodical rept.
Feb 73, 93p BEA-SCB-73-53-02
Paper copy available from GPO $20.00/year as C43.8:53, $2.25/copy as C43.8:53/2; microfiche also available from NTIS $9.00/year.

Descriptors: (*Commerce, Statistical data), (*Economic surveys, United States), Marketing, International trade, Investments, Manufacturing, Salaries, Capital, Inventories, Policies, Sales, Federal budgets, Projects, Income, Classifications, Prices, Value.
Identifiers: Gross national product, Business economics, Foreign direct investments, Commodity data.

In addition to 2,500 statistical series, the February issue includes an assessment of the business situation, and articles on 'Foreign Direct Investment in the United States, 1962-71' and 'Inventory-sales Ratios in Manufacturing and Trade, 1961-72.'

COM-73-50223 PC-GPO/MF$0.95-NTIS
Foreign-Trade Zones Board, Washington, D. C.
ANNUAL REPORT (34TH) OF THE FOREIGN-TRADE ZONES BOARD TO THE CONGRESS OF THE UNITED STATES FOR THE FISCAL YEAR ENDED JUNE 30, 1972.
30 Jun 72, 55p
Paper copy available from GPO $0.45 as FTZ1.1:972.

Descriptors: (*United States, International trade), (*International trade, Statistical data), Municipalities, Reviews, Organizations, Foreign countries, Classifications, Value.
Identifiers: *Foreign trade zones, Commodity data, New York City (New York), New Orleans (Louisiana), San Francisco (California), Seattle (Washington), Mayaguez (Puerto Rico), Honolulu (Hawaii), Bay City (Michigan).

A foreign-trade zone is an enclosed area (considered outside U.S. customs territory, but under customs supervision) in or near a port of entry which is operated as a public utility by a qualified public or private corporation authorized by the Foreign-Trade Zones Board. Foreign and domestic merchandise not otherwise prohibited may be moved into a zone for storage, exhibition, manipulation, manufacture, or other processing. The usual formal customs entry procedure and payment of duties on foreign goods is not required unless and until they enter customs territory for domestic consumption. Domestic goods moved into a zone for export are considered exported upon entering the zone for purposes of excise tax rebates and drawback.

COM-73-70014 PC-CENSUS
Bureau of the Census, Washington, D.C.
CURRENT INDUSTRIAL REPORTS. FATS AND OILS. OILSEED CRUSHING.
Monthly repts.
1973, 12 ISSUES M20J (73)
Paper copy available from Bureau of the Census, Washington, D. C. 20233. $3.00/year including M20K;$0.15/copy.

Descriptors: (*Industries, *Economic surveys), (*Oilseeds, Industries), United States, Soybean oil, Cottonseed oil, Peanut oil, Corn oil, Linseed oil, Classifications, Production, Inventories, Sites, Crushing.
Identifiers: *Oilseed crushings, Monthly summaries, Shipments, State summaries.

The report presents data for the current and preceding month on: Net receipts, crushings, and end-of-month stocks of raw materials at oil mill locations; production, shipments and transfers, and end-of-month stocks of primary products at oil mill locations; production and end-of-month stocks of cottonseed linters at oil mill locations, by types of cut and geographic areas; crushings and stocks of cottonseed and soybeans at oil mills, by States; production and stock of cottonseed products and soybean products at oil mill locations, by States. A summary of crude vegetable oil production is shown for the current month and each of 24 preceding months.

COM-73-70015 PC-CENSUS
Bureau of the Census, Washington, D.C.
CURRENT INDUSTRIAL REPORTS. PLASTIC BOTTLES.
Monthly repts.
1973, 12 ISSUES M30E (73)
Paper copy available from Bureau of the Census, Washington, D.C. 20233. $1.50/year; $0.15/copy.

Descriptors: (*Plastics industry, Blow molding), (*Bottles, Statistical data), Economic surveys, Classifications, Polymers, Utilization.
Identifiers: Current industrial reports, Monthly summaries, Shipments.

The report shows the quantity of shipments and the quantity produced for own use of blow-molded plastics bottles, by type and weight of such bottles, and by type of such bottles, and by type of resin, for the current and preceding month, with comparative figures for current month a year ago. A summary showing quantity of shipments of blow-molded plastics bottles, by end use, for the current month and each of 24 preceding months is included.

COM-73-70016 PC-CENSUS
Bureau of the Census, Washington, D.C.
CURRENT INDUSTRIAL REPORTS. CONSUMPTION ON THE WOOLEN AND WORSTED SYSTEMS.
Monthly repts.
1973, 12 ISSUES M22D (73)
Paper copy available from Bureau of the Census, Washington, D.C. 20233. $2.00/year including MA-22M; $0.15/copy.

Descriptors: (*Textile industry, *Economic surveys), (*Woolen spun yarns, Statistical data), (*Worsted spun yarns, Statistical data), Consumption, Combed yarns, Natural fibers, Manmade fibers, Carpets, Classifications, Production.
Identifiers: Monthly summaries, Current industrial reports.

The report presents data on the quantity of fibers consumed in woolen spinning and worsted combing mills by class of fibers and in the woolen system spinning mills by class of fibers and in the woolen system spinning mills by class of fibers and by end use; and production of tops and noils combed and tow converted to top without combing. Data are for the current and preceding month, with comparative figures for the current month a year ago. A summary showing weekly averages of selected fibers consumed on the woolen and worsted systems for the current month and each of 24 preceding months is also included.

COM-73-70017 PC-CENSUS
Bureau of the Census, Washington, D.C.
CURRENT INDUSTRIAL REPORTS. COTTON, MANMADE FIBER STAPLE, AND LINTERS. CONSUMPTION AND STOCKS, AND SPINDLE ACTIVITY.
Monthly repts.
19 Mar 73, 12 issues M22P (73)
Paper copy available from Bureau of the Census, Washington, D.C. 20233. $1.50/year;$0.15/copy.

Descriptors: (*Textile industry, *Economic surveys), (*Cotton fibers, Statistical data), (*Manmade fibers, Statistical data), (*Linters, Statistical data), Classifications, Consumption, International trade.
Identifiers: Current industrial reports, Exports, State summaries, Imports, Monthly summaries.

Data are presented on: Consumption and stocks of cotton and manmade fiber staple by type of material and specified States; consumption of linters by type of consumer, and stocks of linters by type of establishment; cotton system spinning spindles in place and active spindle hours, by type of fiber spun and specified States; and world supply and distribution of cotton. Data are for the current period, with comparative data for preceding periods. A summary is included, showing daily average consumption and stocks of domestic and foreign cotton and manmade fiber staple; daily average number of spindle hours operated on the cotton system for 100 percent cotton staple, 100 percent manmade fibers, and other fibers and blends; and an index of seasonally adjusted daily average cotton consumption; and selected seasonally adjusted data. Data are for the current month and 24 preceding months.

COM-73-70018 PC-CENSUS
Bureau of the Census, Washington, D.C.
CURRENT INDUSTRIAL REPORTS: MANUFACTURERS: SHIPMENTS, INVENTORIES, AND ORDERS.
Monthly repts.
1973, 12 ISSUES M3-1 (73)
Paper copy available from Bureau of the Census, Washington, D.C. 20233. $1.50/year;$0.15/copy.

Descriptors: (*Manufacturing, Statistical data), Cargo transportation, Inventories, Demand (Economics), Orders (Commitments), Value, Classifications, Seasonal variations, Adjusting.
Identifiers: Current industrial reports, Commodity data, Shipments, Unfilled orders, Manufactured products.

Data are given for the current month and two preceding months (seasonally adjusted), and for the current and previous months, with comparative figures for the current and previous months, with comparative figures for the current month a year ago (without seasonal adjustment) on value of manufacturers' shipments, inventories, and orders, by industry group and for market categories and supplementary series; and value of manufacturers' inventories by stage of fabrication, by industry group. Also given are the ratios of manufacturers' inventories to shipments, and of unfilled orders to shipments, by industry group. Monthly rates of change, and average percent changes from 1967 to 1972 for shipments, inventories, and orders for the nondurable goods industry groups are included.

COM-73-70019 PC-CENSUS
Bureau of the Census, Washington, D.C.
CURRENT INDUSTRIAL REPORTS: INVENTORIES OF STEEL MILL SHAPES.
Monthly repts.
1973, 12 ISSUES M33-3 (73)
Paper copy available from Bureau of the Census, Washington, D.C. 20233. $1.75/year including MA-33B;$0.15/copy.

Descriptors: (*Iron and steel industry, *Economic surveys), (*Metal shapes, Statistical data), Inventories, Consumption, Sales, Value, Classifications.
Identifiers: Monthly summaries, Current industrial reports, Receipts.

For the current month and each of 24 preceding months, data are presented on the quantity of receipts, consumption, and end-of-month inventories of consumers (manufacturers only); value of sales, and quantity and value of end-of-month inventories of service centers (warehouses); and quantity of inventories of steel in process and finished steel of producing mills.

JPRS-58229 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
THE USSR NATIONAL ECONOMY: 1922-1972.
14 Feb 73, 7p

Trans. of mono. Narodnoe Khozyaistvo SSSR: 1922-1972, Moscow, 1972 p361-362.

Descriptors: (*Economics, *USSR), Income, Statistical data, Consumption, Accumulation, Expenses, Translations.
Identifiers: *National income.

The report contains a discussion of the increase in the national income produced in the national economy (1922-1972) which is comprised of the consumption fund, the accumulation fund, and other expenditures. (Author)

K-AA-1034 PC$3.00/MF$0.95
Union Carbide Corp., Oak Ridge, Tenn. Nuclear Div.
DETERMINING THE REASONABLENESS OF COSTS.
1972, 13p CONF-721040-3
From 16. Annual Aec Contractors Purchasing Agents Conference- Cincinnati, Oh (24 Oct 1972).

Descriptors: *Economics.

For abstract, see NSA 27 06, number 14392.

K-AA-1035 PC$3.00/MF$0.95
Union Carbide Corp., Oak Ridge, Tenn. Nuclear Div.
PURCHASING APPLICATION FOR THE AUTOMATED TYPING CENTER.
1972, 10p CONF-721040-4
From 16. Annual Aec Contractors Purchasing Agents Conference- Cincinnati, Oh (24 Oct 1972).

Descriptors: *Oak ridge national laboratory.

For abstract, see NSA 27 06, number 14393.

N73-16944 PC$16.00/MF$0.95
Texas Univ., Austin. Bureau of Business Research.
A CONTRIBUTION TO THE DEVELOPMENT OF AN ECONOMIC ATLAS OF THE HOUSTON AREA TEST SITE.
31 Dec 72, 277p NASA-CR-128719
Contract NAS9-12949

Descriptors: *Economic analysis, *Industrial plants, *Social factors, *Texas, Catalogs, Universities.

For abstract, see STAR 11 07.

PB-215 720/4 PC$3.00/MF$0.95
Cornell Univ., Ithaca, N.Y. Regional Rehabilitation Research Inst.
PRODUCTION SYSTEMS IN SHELTERED WORKSHOPS,
William H. Button, and Bart K. Lubow. Jan 71, 20p SRS-12-55025-2G
Grant SRS-12-55025
Pub. as Organization and Administration of Sheltered Workshops: Research rept. no. 6.

Descriptors: (*Rehabilitation, Industries), (*Industries, Productivity), Centers, Systems analysis, Performance evaluation, Classifications, Job analysis, Budgeting, Statistical data.
Identifiers: *Sheltered workshops, *Vocational rehabilitation, Staff personnel.

The report presents data regarding production systems of 123 sheltered workshops for the use of administrators interested in developing production systems appropriate to their clients' requirements. The essential systems characteristics of a sheltered workshop are defined and explained, and available data regarding actual workshops are related to the systems model. The study isolates 18 job groups performed at various levels; these are further grouped into four major skill types: low manual, high manual, white-collar, and service occupations. (Author)

PB-216 073/7 PC$3.00/MF$0.95
Harvard Coll., Cambridge, Mass.
EXPLANATIONS OF INEQUALITY: EMPIRICAL ANALYSES OF THE ROLE OF EDUCATION, SKILLS, TECHNOLOGY, AND MIGRATION IN ECONOMIC OPPORTUNITY.
Final rept.,
Samuel Bowles. Feb 72, 25p SRS-12-55009-11
Contract SRS-12-55009, Grant SRS-RD-7800-G-70-62

Descriptors: (*Income, Socioeconomic status), (*Education, Income), Statistical distributions, Social change, Population migrations.
Identifiers: Technology.

The report outlines a series of related research projects on how human resources and other factors influence the United States income distribution and its change over time. Eight research projects are briefly described in this report: statistical income distributions; relationships between education, technology and incomes; the personality correlates of economic success; social class, education and income; social class, IQ, and the inheritance of inequality; social mobility, flow between poor and nonpoor; the economics of migration; and an investigation of technical change, human resources, and poverty through a case study of the tobacco industry.

PB-216 331/9 PC$3.50/MF$0.95
Southwestern Illinois Metropolitan Area Planning Commission, Collinsville.
FEDERAL GENERAL REVENUE SHARING.
Final rept.,
8 Dec 72, 26p SWIL-MAPC-72-10

Descriptors: (*Revenue, Financial management), (*National government, Revenue), Legislation, Reviews, Regulations, State government, Local government.
Identifiers: *Revenue sharing.

Contents:
- Review of the State and Local Fiscal Assistance Act of 1972;
- Description of formulas and data;
- Explanation of revenue sharing regulations;
- Discussion of potential problems and difficulties;
- Summary of questions and answers.

TT-70-55099/7-8 PC$6.00
Department of Housing and Urban Development, Washington, D.C. Office of International Affairs.
PLANNED ECONOMY. VOLUME 24, NUMBER 7-8, 1969.
1972, 315p
Trans. of Gospodarka Planowa (Poland) v24 n7/8 1969, by Waldemar Bartoszewski and Leon Ter-Oganjan. The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Economic surveys, *Poland), Population growth, Income, Employment, Policies, Rebuilding, Industrial management, Economic development, Investments, Forecasting, Translations, Reviews.
Identifiers: *Planned economies.

A report is made on the pattern of periodicity of postwar economic policy in Poland, including the years 1944-1949, called the phase of rebuilding and economic reconstruction, the years 1950-1954, the period of construction of the foundations of socialist industrialization, the years 1955-1960, the phase of a more proportional and better balanced economic growth and the conclusion of the stage of industrialization embraced in the six-year plan, and the years 1961-1968, resulting from the necessity of intensifying the rate of investments and of speeding up growth to solve the problem of postwar demographic explosion and to provide new jobs on time.

5D. History, Law, and Political Science

AD-757 060 PC$5.45/MF$0.95
Center for Naval Analyses Arlington Va Naval Warfare Analysis Group
HANDBOOK OF JUDICIAL DECISIONS (THROUGH 20 OCTOBER 1972) INVOLVING ENVIRONMENTAL IMPACT STATEMENTS,
John W. Wilmer, Jr. Nov 72, 121p* Rept no. NWAG-Research Contrib-224
Contract N00014-68-A-0091

Descriptors: (*Environment, *Law), United States government, Reviews.
Identifiers: *Environmental impact statements, *Government policies, *Government agencies, *National Environmental Policy Act.

This handbook is intended for Navy and other Government officials who must decide whether or not to file an environmental impact statement (EIS) and whether or not a statement that will be made is sufficient. It is intended to be used as a supplement to applicable guidelines on NEPA. It presents the decisions and reasons of a court's finding. Statements made by the court which are not directly related to an EIS outcome also will be found. Most of these statements center on whether an injunction should be issued while an EIS is being prepared or revised. The places in which they occur are indicated in the Index of Topics. Some of the cases included concern: National security, Housing, Energy (Oil), Energy (Electric), Energy (Atomic), Energy (Helium), Energy (Natural Gas), Sewage, Waterways and Highways.

JPRS-58317 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
THE NIXON DOCTRINE,
Yu. P. Davydov, V. V. Zhurkin, and V. S. Rudnev. 26 Feb 73, 218p
Trans. of mono. Doktrina Niksona, Moscow, 1972 232p.

Descriptors: (*Foreign policy, United States Government), (*USSR, Opinions), Reviews, Political science, Negotiations, International relations, Policies, Leadership, Military psychology, China, Vietnam, Western Europe, Near East, Japan, Concepts, Translations.
Identifiers: Nixon doctrine.

The book analyzes the U.S. foreign policy course known as the Nixon Doctrine.

PB-214 962/3 PC-GPO/MF$0.95-NTIS
Commission on Government Procurement, Washington, D.C.
SUMMARY OF THE REPORT OF THE COMMISSION ON GOVERNMENT PROCUREMENT.
Dec 72, 143p
Paper copy available from GPO $1.25 as stock no. 5255-00005.

Descriptors: (*Government procurement, Reports), Government policies, Administrative law, Decision making, Negotiated contracts, Contract administration, Grants, Patents, Copyrights.

The Report of the Commission on Government Procurement consists of ten parts packaged in four volumes: Volume 1 General Procurement Considerations, Volume 2 Acquisition of Research and Development, Acquisition of Major Systems, Volume 3 Acquisition of Commercial Products, Acquisition of Construction and Architect-Engineer Services, Federal Grant-type Assistance Programs, Volume 4 Legal and Administrative Remedies, Selected Issues of Liability: Government Property and Catastrophic Accidents, Patents, Technical Data, and Copyrights, Other Statutory Considerations. (Author)

PB-215 629/7 PC$6.75/MF$0.95
National Academy of Engineering, Washington, D.C. Marine Board.
OUTER CONTINENTAL SHELF RESOURCE DEVELOPMENT SAFETY: A REVIEW OF TECHNOLOGY AND REGULATION FOR THE SYSTEMATIC MINIMIZATION OF ENVIRONMENTAL INTRUSION FROM PETROLEUM PRODUCTS.
Dec 72, 212p*

Descriptors: (*Continental shelves, *Offshore drilling), (*Water pollution, *Oil wells), (*Oil recovery, Regulations), Reserves, Petroleum industry, Personnel development, Recommendations, Legislation, Accidents, Exploration, Geophysical prospecting, Reviews, National government, Information centers.
Identifiers: *Oil pollution control, *Water pollution abatement, Oil spills, Technology assessment.

Offshore oil resource development safety is considered from the standpoint of minimizing the potential for sudden, massive, and small continued releases of oil to the environment. The numerous aspects of technology ranging from geophysical exploration to well workover and abandonment are described briefly and evaluated for possible hazards. The effectiveness of present regulations and inspections is evaluated and conclusions presented. Precedents for improved practices in other areas of government regulatory responsibility are examined and recommendations are made concerning improvements to regulations and standards for use offshore. The need for additional safety-related information is examined and means for improvement are recommended. Training and personnel qualification are considered and recommendations are given.

PB-216 961/3 PC$3.00/MF$0.95
Maryland Univ., College Park. Project on the Economics of Discrimination.
LEGAL STRATEGIES FOR DEALING WITH HEROIN ADDICTION,
Christopher Clague. Oct 72, 22p OEO-LN-1241

Descriptors: (*Drug addiction, *Law (Jurisprudence)), Narcotics, Criminal law, Law enforcement, Criminology.
Identifiers: *Heroin.

The paper discusses the punitive and maintenance systems for dealing with heroin addiction.

5E. Human Factors Engineering

AD-757 216 PC$3.00/MF$0.95
Mcdonnell Aircraft Co St Louis Mo
THE HIGH G APPROACH.
Summary rept.,
P. V. Kulwicki, and J. M. Sinnett. 20 Feb 73, 27p
Rept no. MDC-A2169 AMRL-TR-73-27
Contract F33615-72-C-1574

Descriptors: (*Aircraft seats, Acceleration tolerance), (*Cockpits, Design), (*Human engineering, Cockpits), Maneuverability, Blood circulation, Visual acuity, Tracking, Digital computers, Simulation, Performance (Human), Efficiency.
Identifiers: *G loading.

The High G Approach is an innovative approach to cockpit design which provides a unique match of pilot capabilities and airplane performance potential. The High G Approach provides an option for the pilot to think, command and control his aircraft at sustained load factor levels well above 7 G. The result, in the context of emerging fighter capability, is a dramatic increase in combat effectiveness and operational advantage. (Author)

AD-757 252 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
EFFECTS OF NEUROMUSCULAR TENSION IN THE USE OF AN ISOMETRIC HAND CONTROLLER.
Master's thesis,
William Steele Smith, Jr. Dec 72, 50p

Descriptors: (*Flight control systems, Neuromuscular transmission), (*Human engineering, Neuromuscular transmission), Operators (Personnel), Muscles, Pilots, Performance (Human), Theses.
Identifiers: *Isometric controllers, Fly by wire flight control systems.

The effects of operator workload on average grip pressure and of neuromuscular tension on tracking performance were the objects of this research. In one experiment, a 'sub-critical' tracking task was performed by the operator while measurements of grip pressure were taken. In a second experiment, the operator was required to maintain average grip pressure at specified levels during 100-second tracking tasks while his RMS tracking error was measured. The results clearly indicate that average grip pressure increases as the workload increases and that higher average grip pressures result in higher RMS tracking error values. (Author)

N73-16098 PC$3.50/MF$0.95
Royal Aircraft Establishment, Farnborough (England).
THE EFFECT OF HANDEDNESS ON A TRACKING TASK.
R. V. Wilson. Aug 72, 26p RAE-TR-72117, BR-31173

Descriptors: *Compensatory tracking, *Hand (anatomy), *Human performance, *Visual tasks, Analysis of variance, Learning, Psychomotor performance.

For abstract, see STAR 11 07.

N73-16099 PC$3.75/MF$0.95
Royal Aircraft Establishment, Farnborough (England).
A PROJECTED GRID METHOD FOR RECORDING THE SHAPE OF THE HUMAN FACE.
J. Cobb. Mar 72, 33p RAE-TR-71184, BR-28791

Descriptors: *Anthropometry, *Contours, *Face (anatomy), *Oxygen masks, *Photographic recording, Color photography, Equipment specifications, Fitting, Flight crews, Grids, Lenses, Shapes.

For abstract, see STAR 11 07.

N73-16100 PC$6.25/MF$0.95
Southampton Univ. (England). Inst. of Sound and Vibration Research.
THE TRANSMISSION OF TRIAXIAL VIBRATION TO PILOTS IN THE SCOUT AH MKI HELICOPTER.
M. J. Griffin. Aug 72, 82p ISVR-TR-58

Descriptors: *Human factors engineering, *P-531 helicopter, *Pilots (personnel), *Triaxial stresses, *Vibration effects, Flight conditions, Physiological effects, Pilot performance, Vibration measurement, Vibrational spectra.

For abstract, see STAR 11 07.

N73-16924 PC$5.25/MF$0.95
Research Inst. of National Defence, Stockholm (Sweden).
THE TEMPERATURE RISE IN A HERMETICALLY SEALED STANDARD SHELTER WITH AND WITHOUT FIRE OUTSIDE.
B. Martensson, and I. Lill. Mar 71, 63p
FOA-1-A-1527-76
Language Swedish

Descriptors: *Buildings, *Human reactions, *Human tolerances, *Shelters, *Stress (physiology), *Temperature effects, Environmental control, Environmental engineering, Human factors engineering, Physiological effects.

For abstract, see STAR 11 07.

PB-216 186/7 PC$3.00/MF$0.95
British Steel Corp. (England). Human Factors Dept.
INDUSTRIAL ERGONOMICS ABSTRACTS, VOLUME 4, NUMBER 2.
BISRA Open rept.
Dec 72, 10p HF/31/72
See also Volume 4, no. 1, PB-212 204.

Descriptors: (*Human factors engineering, *Abstracts), (*Industrial engineering, Human factors engineering), Industrial atmospheres, Environmental engineering, Workplace layout, Anthropometry, Man-machine systems, Design, Protective clothing, Safe handling, Noise (Sound), Vibration, Industrial training, Work measurement, Observation, Time studies, Mathematical models, Iron and steel industry, Great Britain.

Contents:
- Workplace and equipment design;
- Environmental design (illumination, noise, vibration, thermal conditions);
- The design of the man-machine interface - environmental design (specialized and protective clothing, specialised and protective equipment);
- Work organisation;
- Training;
- Methods, techniques and equipment in ergonomics-investigation of man as a systems component (psychology, physiology, anthropometry and biomechanics);
- Methods, techniques and equipment in ergonomics - investigation of systems design and organisation - work design and organisation.

5H. Man-Machine Relations

AD-757 716 PC$3.00/MF$0.95
Texas Tech Univ Lubbock Center of Biotechnology and Human Performance
PERFORMANCE, RECOVERY AND MAN-MACHINE EFFECTIVENESS.
Semi-annual progress rept. 1 Sep 72-28 Feb 73,
Richard A. Dudek. 15 Mar 73, 22p
Contract DAAD05-69-C-0102
See also report dated 15 Sep 72, AD-750 176.

Descriptors: (*Man-machine systems, Effectiveness), (*Human engineering, Performance (Human)), Rhythm (Biology), Environment, Scopolamine, Stress (Psychology), Stress (Physiology), Scopolamine, Fatigue (Physiology), Heat tolerance, Military personnel.
Identifiers: *Work rest cycles, Progress reports, Circadian rhythms.

The project is concerned with the assessment of human performance and recovery capabilities under relatively long duration conditions (two hours or more). Varying work/rest schedules and environments are among the variables manipulated, and the results relate to the doctrine of continuous operations. During this reporting period, a report was prepared describing the results of a study of 8 and 16 hours of continuous work; experiments were continued to ascertain the effects of methyl scoppolmine on (animal) response decrements; a report was begun on the relation between circadian rhythms and performance on a physical loading task; and research continued on heat stress limits for sedentary operations. Three papers were presented at meetings, three published, three accepted for publication, and four were submitted. This progress report contains a list of 27 topics of potential military relevance

derived from the studies conducted from 1968 to the present. (Author)

JPRS-58290 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
INTERACTION OF MAN-MACHINE SYSTEMS,
E. V. Khrunov, and A. G. Bryzhatyi. 22 Feb 73, 23p
Trans. of Voprosy Psikhologii (USSR) n6 p80-85, 94-102 1972.

Descriptors: (*Man machine systems, Interactions), (*Bioengineering, USSR), Spacecraft docking, Psychophysics, Human factors engineering, Computer programming, Translations, Cybernetics.

The report contains articles on the interaction of man and the electronic computer in operational planning and on psychological engineering and psychophysiological aspects of the activity of a cosmonaut-operator during docking and ship-to-ship transfer. (Author)

5I. Personnel Selection, Training, and Evaluation

AD-757 018 PC$3.00/MF$0.95
Naval Personnel Research and Development Lab Washington D C
OCCUPATIONAL ANALYSIS: REPORT OF ANALYSIS OF JOB SATISFACTION DATA FOR AEROGRAPHER'S MATE RATING,
Lawrence A. Goldman. Feb 73, 71p Rept no. WTR-73-13

Descriptors: (*Meteorology, Naval personnel), (*Naval personnel, *Attitudes), Employment, Job analysis, Weather forecasting, Personnel management, Regression analysis, Programming (Computers), Mathematical prediction, Classification.
Identifiers: *Aerographers mates, Job satisfaction, Job dissatisfaction, Reenlistment intent.

A study is reported of the extent of satisfaction/dissatisfaction, for 710 billet incumbents of the aerographer's mate (AG) rating, based on 33 job factors and two overall measures of satisfaction. Differences, if any, based on military paygrade, reenlistment intention, sex, and mental ability level for these billet incumbents are studied. In terms of all AG's, those job factors which are relatively more satisfying and relatively more dissatisfying are ascertained. Recommendations are made to improve upon the analysis of job satisfaction in other Navy ratings. (Author Modified Abstract)

AD-757 054 PC$3.00/MF$0.95
Florida State Univ Tallahassee Computer-Assisted Instruction Center
EFFECT OF COMPUTER TUTORIAL REVIEW LESSONS ON EXAM PERFORMANCE IN INTRODUCTORY COLLEGE PHYSICS.
Technical memo.,
Ora M. Kromhout. 1 Oct 72, 31p Rept no. CAI-TM-64
Contract N00014-68-A-0494

Descriptors: (*Programmed instruction, Performance (Human)), Effectiveness, Physics, Statistical data.
Identifiers: Computer aided instruction.

Computer tutorial review lessons for a one-quarter lecture course in introductory college physics were developed and used by approximately 500 students, on a voluntary basis, over a period of several years. The investigation shows that the exam grades of students who used the computer materials is significantly higher (.01 level) than the class as a whole, if results from sections are pooled. Evidence is presented to show that this is not primarily due to a factor of selection because of the voluntary basis for participation. (Author)

AD-757 055 PC$3.00/MF$0.95
Florida State Univ Tallahassee Computer-Assisted Instruction Center
INCIDENTAL AND RELEVANT LEARNING WITH INSTRUCTIONAL OBJECTIVES.
Technical memo.,
Philippe C. Duchastel. 1 Nov 72, 32p Rept no. CAI-TM-66
Contract N00014-68-A-0494

Descriptors: (*Learning, Motivation), Decision making.

It was hypothesized that one role of objectives in learning is to serve as orienting stimuli by which the learner can decide which material to concentrate on, and which to pay less attention to. With a brief text to learn, 58 college students received either one-half of the 24 objectives for the text, or no objectives at all. As expected, the Ss with half of the objectives performed better than their counterparts without objectives on the posttest items referenced to their objectives (relevant learning), and less well on the items not covered by their objectives (incidental learning). That these findings conflict with previous research results with respect to incidental learning, could result from the fact that the Ss in the present study had practical experience with an objective-referenced instructional model. (Author)

AD-757 108 PC$3.00/MF$0.95
B-K Dynamics Inc Rockville Md
DEVELOPMENT OF UTILITY MEASURES FOR MANPOWER PLANNING.
Technical rept. 15 May-31 Dec 72,
John R. Schmid, Richard K. Hovey, Philip Postelle, and Joseph Bernard. Feb 73, 174p Rept no. BKD-TR-3-177
Contract N00014-72-C-0526

Descriptors: (*Naval personnel, Personnel management), (*Personnel management, Mathematical models), Analysis of variance, Questionnaires.
Identifiers: Utility theory, Manpower planning.

The report describes the results of the first seven months of research directed toward developing a new tool for manpower planning - an enlisted personnel utility model. During this period, the opinions of Navy officers and enlisted men were solicited and analyzed to establish a quantitative measure of enlisted personnel utility as a function of length of service, paygrade, and rating. Two experiments were performed; the first used a Delphi procedure. In the second experiment, a one-time questionnaire was administered. (Author)

AD-757 243 PC$3.00/MF$0.95
Instrument Flight Center Randolph AFB Tex
ATC ANGLE OF ATTACK TRAINING.
Final rept. 3 Sep 71-18 Jul 72,
Max L. Odle. Jul 72, 91p Rept no. IFC-TR-72-3

Descriptors: (*Jet training planes, Aviation safety), (*Approach indicators, *Angle of attack), (*Air Force training, Aircraft landings), Display systems, Stall-warning indicators, Performance (Engineering), Human engineering.
Identifiers: Pilot training, T-38 aircraft.

An evaluation and study was conducted of the Bendix Standardized Angle of Attack (AOA) System for its use in Air Training Command flying training programs. The Bendix AOA System was installed in T-38, S/N 70-1549 for engineering flight test. The aircraft was then flown to Randolph AFB for pilot factors evaluation and determination of exactly what flying maneuvers could be flown using AOA as the controlling parameter and how AOA should be used in these maneuvers. Subjective data on the procedures and techniques for AOA use were gathered from twelve T-38 instructor pilots from the Pilot Instructor Training (PIT) and Instrument Pilot Instructor School (IPIS) at Randolph AFB. The conclusions from the study are given. (Author Modified Abstract)

AD-757 279 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
PERSONNEL SYSTEM PROJECTION MODEL.
Master's thesis,
Luis Vargas Cooban. Dec 72, 70p

Descriptors: (*Personnel management, Mathematical models), (*Manpower, Optimization), Simulation, Management planning, Time, Computer programs, Subroutines, Flow charting, Systems engineering, Naval personnel, Mathematical prediction, Officer personnel, Theses.
Identifiers: FORTRAN, Computerized simulation.

A personnel system is simulated for use by the personnel planner as a tool to help solve manpower problems utilizing the benefits of a computer. The input parameters are time in grade and time in the system of each individual, the manpower requirements in each grade, annual input to the system, and the number of years to run the simulation. The dynamic properties of the simulation are loss rates and promotion rates. A decision maker runs the model to determine the effects of changes in the input parameters. One of the problems that can be solved with the model is manpower shortage. A sample problem is presented. Flowcharts and a listing of the FORTRAN program are included. (Author)

AD-757 355 PC$3.00/MF$0.95
Naval Technical Training Command Millington Tenn Research Branch
PREVENTIVE COUNSELING AND PRESCRIPTIVE REMEDIATION.
Research branch rept.,
Diane Mims, and Richard N. Gaines. Mar 73, 18p Rept no. RBR-9-73

Descriptors: (*Personnel management, Experimental design), (*Naval personnel, Retraining), Problem solving, Performance (Human), Programmed instruction, Teaching methods, Test methods, Technicians.
Identifiers: *Preventive counseling, Prescriptive remediation, Avionics.

The report evaluates the effects of redefining the role of a counselor in the AV (A) School so that intensified counseling is administered to potential failures before the trainee takes the unit examination as opposed to normal post-failure counseling. In addition, two types of remediation were evaluated. An existing system of one week set back review remediation was compared with a self-paced programmed instruction. (Author Modified Abstract)

AD-757 415 PC$4.85/MF$0.95
American Institutes for Research Silver Spring Md
NEW TECHNIQUES FOR MEASURING AND IMPROVING READING COMPREHENSION.
Technical rept.,
Ronald P. Carver. 15 Feb 73, 82p* Rept nos. AIR-R73-2, AIR-30800-2/73-TR-1
Contract N00014-72-C-0240

Descriptors: (*Reading, Psychometrics), (*Training devices, Reading), (*Programmed instruction, Reading), Learning, Problem solving, Effectiveness, Performance tests.
Identifiers: *Comprehension.

A standardized method was developed which will convert prose training materials into a form which forces the trainees to read the material with at least a minimal level of comprehension. The materials, called programmed prose materials, are developed in an objective manner amenable to computer production. Phase I of the project involved an extensive investigation of a new technique, called the reading-storage test, for measuring the learning that occurs during reading so that the effectiveness of programmed prose could be properly assessed in Phases II, III, and IV. This report covers the Phase I and Phase II research. It was concluded that: the objectively developed reading-storage test is valid as a measure of the

learning, understanding, comprehending, or information storing that occurs during reading; and programmed prose facilitates learning in reading situations wherein attention wanes. (Author Modified Abstract)

AD-757 668 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
CHARACTERISTICS OF GRADING MODELS,
Master's thesis,
David Edward Polzien. Dec 72, 50p

Descriptors: (*Performance (Human), *Records), Mathematical models, Operations research, Analysis of variance, Classification, Reviews, Theses.
Identifiers: *Grading systems.

Since the grading process most often used is a mathematical process, it seems desirable to examine grading systems from the mathematical point of view. In the paper the familiar five-letter grading system is molded mathematically. Variance of the grade point average is used as the measure of effectiveness. The grading system and its parameters are defined and the effect of variation in the parameters of the student performance distribution is observed. The effect of having multiple graders in a grading system is also modeled as is the effect of changing the number of grading categories in a grading system. (Author Modified Abstract)

AD-757 693 PC$3.00/MF$0.95
Naval Aerospace Medical Research Lab Pensacola Fla
THE USE OF CONFIDENTIAL INSTRUCTOR RATINGS FOR THE PREDICTION OF SUCCESS IN NAVAL UNDERGRADUATE PILOT TRAINING,
Wayne L. Waag, Richard H. Shannon, and Rosalie K. Ambler. 7 Feb 73, 17p Rept no. NAMRL-1175

Descriptors: (*Pilots, *Naval training), Selection, Predictions, Personnel management, Performance (Human).
Identifiers: *Pilot training.

Previous investigations have reported significant relationships between confidential instructor ratings in early primary phase and later success in Naval flight training. Such ratings were found to increase significantly the validities derived solely from selection test scores. However, such findings do not guarantee that confidential ratings would augment the validities derived from the combined array of selection and early training variables which are used in the current student pilot prediction system. The purpose of the present study was to determine whether such confidential ratings provided non-redundant information which would increase the predictive value of the present system. The results clearly indicated that confidential ratings obtained from Primary flight instructors provided information relating to the student's probability of receiving his wings. Such ratings were found to significantly increase the predictive validities derived from the variables which are used currently in the student pilot prediction system. Such findings suggest that these confidential evaluations provide additional information beyond that which is reflected in the grades he assigns. It is recommended that confidential instructor ratings be implemented on a permanent basis in the presolo stage. The present student pilot prediction system should be revised to incorporate this information. (Author)

AD-757 702 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
DEVELOPMENT OF A MAN-TO-MAN RATING SCALE FOR EVALUATING PERFORMANCE.
Technical rept.,
William H. Githens, and Richard S. Elster. Feb 73, 25p* Rept no. NPS-55GH73021A

Descriptors: (*Naval personnel, *Performance (Human)), Scale, Standards, Statistical analysis.
Identifiers: *Performance evaluation.

Over the years a continuous problem with performance rating systems has been the leniency and the non-comparability of marks assigned by different evaluators. By utilizing a computer, a method was developed which overcomes this problem. In this new method the evaluators must compare their ratees to other specific ratees (anchors) who are under other evaluators. All ratees receive their scale value based on their relative position to the anchoring points that were used by the evaluator. A trial of the method was made on ten groups, each composed of 12 students. Each group has two evaluators. The characteristics rated were Industry, Academic Ability, Judgment, and Cooperation. These were considered as relevant characteristics to the 'job' of being a student. The groups had been relatively intact for approximately one year prior to the evaluations. A comparison of the results of using the standard fitness report rating method (RAW) and the man-to-man method (MM and MMQ) revealed that the man-to-man method was superior based on certain statistical qualities. The man-to-man method resulted in a greater spread of scores and, more importantly, resulted in higher inter-rater agreement than the standard rating method. An outside cirterion of Quality Point Average was available for the 'Academic Ability' scale. Both the standard methodology and the man-to-man methodology produced rating values which were highly related to this outside criterion, .68 and .71 respectively. (Author Modified Abstract)

COM-73-10379 PC$3.00/MF$0.95
Four Corners Regional Commission, Farmington, N. Mex.
THE BLUE MOUNTAIN ENVIRONMENTAL SCHOOL, MONTICELLO, UTAH.
Final rept.,
Lawrence P. Bailey, Doyle B. Rowley, and Kenneth M. Topham. 1971, 22p FCRC-TA-401-214 062

Descriptors: (*Education, Environments), (*Utah, Education), Mountains, Grazing land, Farm crops, Lumbering, Air pollution, Water pollution, Instructors, Learning, Students.
Identifiers: *Monticello (Utah), Blue Mountain Environmental School.

The document discusses the programs, methods of instructions and environmental studies of the area in classroom and field trips which the Blue Mountain school offered. (Author Modified Abstract)

COM-73-10382 PC$3.00/MF$0.95
New Mexico Technical-Vocational School, Espanola.
NEW MEXICO TECHNICAL-VOCATIONAL AREA SCHOOL PROJECT.
Final rept.,
Seledon C. Martinez. Jun 71, 23p FCRC-TA-301-215-034

Descriptors: (*Education, *New Mexico), (*Schools, *Industrial training), Regional planning, Rural areas, Community development, Urban areas, Surveys, Project planning.
Identifiers: *Vocational education, *Technical schools, Taos County (New Mexico), Rio Arriba County (New Mexico).

Planning and implementation are outlined for an area vocational school to serve Taos and Rio Arriba Counties, New Mexico. (Author)

COM-73-10387 PC$3.00/MF$0.95
Sterling Inst., Washington, D.C.
A PROPOSED SUPPLEMENT TO THE STATE PLAN FOR VOCATIONAL-TECHNICAL EDUCATION IN UTAH.
Sep 69, 74p FCRC-TA-691-266-002-UT

Descriptors: (*Education, Utah), (*Industrial training, *Regional planning), Surveys, Employment, Vocational guidance, Manpower utilization, Project planning, American Indians, Economic development, State government, Schools.
Identifiers: *Four Corners region, *Vocational education, *Technical schools.

Regional data are presented in order to secure a comprehensive master plan for vocational education in the Four Corners Region. (Author Modified Abstract)

PB-215 351/8 PC$3.00/MF$0.95
Oregon State Dept. of Education, Salem. Div. of Vocational Rehabilitation.
PROGRAM INFORMATION AND EVALUATION SYSTEM (PIES).
Final rept.
Dec 71, 105p SRS-12-55297-0A
Grant SRS-RD-2987-G
See also PB-215 431.

Descriptors: (*Rehabilitation, *Project management), (*Services, Benefit cost analysis), Mathematical models, Budgeting, Operations research, Planning, Evaluation, Decision making.
Identifiers: *Vocational rehabilitation, *Social services, Management information systems.

The report describes research directed toward the development of a decision-making model for the evaluation and regulation of human resources agency programs utilizing the needs of clients as the dominant framework for program decisions. The research was designed to develop a general purpose program evaluation model applicable to all human resource agencies to develop a client-centered information system designed to enhance program planning, budgeting, and evaluation activities and to develop a cost/benefit model linked to program planning, budgeting, and evaluation. The paper describes the evaluation model and its application to three agency programs. The report also includes a section on the use of graphics in the presentation of various classes of information. The team of economists who aided in the development of a cost/benefit analysis also produced a report which forms an appendix to the paper.

PB-215 427/6 PC$3.00/MF$0.95
Vanderbilt Univ., Nashville, Tenn. Dept. of Psychology.
LANGUAGE DEVELOPMENT IN THE MENTALLY RETARDED.
Final rept.,
Robert M. Liebert, Richard D. Odom, and Rita W. Poulos. Aug 71, 46p SRS-14-55165-A
Grants SRS-14-55165, SRS-RD-2952-S
Prepared in cooperation with State Univ. of New York, Stony Brook. Dept. of Psychology.

Descriptors: (*Education, *Mental deficiency), (*Languages, *Learning), Cognition, Effectiveness, Comprehension, Syntax, Statistical analysis.

The purpose of the study was to investigate the development of grammatical comprehension and production syntactic relationships in the mentally retarded. The program was designed to facilitate the production of certain syntactical construction and the use of vocabulary. Materials developed for the study consisted of two units of lesson plans, audio tapes, tests of language facility, student evaluation charts, etc. A series of five studies was designed and tested with groups of mentally retarded subjects from both residential and day programs. The control group was utilized in four of the five studies. The results of the studies were treated statistically with analysis of variance techniques. Audio tapes of modeled and rewarded linguistic constructions were shown to have durable effects on syntactical production, as evidenced by the recall of these constructions after the passage of time.

PB-215 430/0 PC$3.00/MF$0.95
Industrial Services, Inc., Los Angeles, Calif.

LOS ANGELES SERVICES TO THE HOMEBOUND.
Final rept.,
William E. Nation, and William D. Young. 31 May 71, 45p SRS-12-55293-9
Grant SRS-12-55293

Descriptors: (*Rehabilitation, *Employment), (*Armed Forces personnel, Rehabilitation), Feasibility, Organizations, Operations research.
Identifiers: Homebound persons, Disabled persons, Vocational rehabilitation.

A short-term pilot project investigating the vocational potential of homebound individuals found that clients increased productivity 27.4 percent in a satellite facility and those employed at home improved productivity 8 percent. There was high interest among community agencies in obtaining service for homebound individuals, and these agencies can be expected to refer clients, contribute to the cost of the program, and participate jointly in organizing and operating a program. It is feasible to operate a work program for homebound and satellite groups and to provide the service on a larger scale.

PB-215 446/6 PC$3.00/MF$0.95
Delgado Junior Coll., New Orleans, La. Dept. of Rehabilitation.
SOME INFLUENCES OF FAMILY GROUP THERAPY ON THE REHABILITATION POTENTIAL OF CLIENTS.
Final rept.,
John P. Galloway, and Harris K. Goldstein. 1971, 118p SRS-12-55223-6
Grant SRS-12-55223

Descriptors: (*Rehabilitation, *Employment), (*Group therapy, Rehabilitation), Attitudes, Interpersonal relations, Family relations.

In researching group therapy (April 1968-December 1970), handicapped clients of a New Orleans rehabilitation center, whose relatives participated in 16 weeks of group therapy, displayed a greater improvement in work orientation, self-esteem, and satisfaction with and understanding of their home situation than did a control group of clients whose family members did not take part in group therapy. Findings of the study support the view that the nuclear family, rather than the patient alone, must participate in therapeutic procedures if improvement is to be effected, and that consideration of the patient as an isolated individual is not a tenable position.

PB-215 534/9 PC$9.00/MF$0.95
Personnel Decisions, Inc., Minneapolis, Minn.
DEVELOPMENT OF PSYCHIATRIC STANDARDS FOR POLICE SELECTION.
Rept. for 15 May 71-15 Jul 72,
Robert W. Heckman, Dennis M. Groner, Marvin D. Dunnette, and Paul D. Johnson. Jun 72, 364p*
Grant LEAA-NI-71-085-G

Descriptors: (*Police, *Personnel selection), (*Personality tests, Police), Psychiatric tests, Standards, Specialized training, Job analysis.

The police manpower project assessed those personality characteristics that are relevant to on-the-job police performance and determined nationally applicable personality standards to aid officials in the selection of new police officers. A number of personality tests and job situations are selected to measure these behaviors, and the tests and simulations are normed for different types of police departments and geographical areas. The manual from this project includes guidelines for the application of psychiatric test and standards to police selection.

PB-215 610/7 PC-GPO/MF$0.95-NTIS
National Inst. of Law Enforcement and Criminal Justice, Washington, D.C.
INTRODUCING A LAW ENFORCEMENT CURRICULUM AT A STATE UNIVERSITY,
Peter P. Lejins. Jul 70, 51p ICR-70-2
Paper copy available from GPO $0.30 as J1.36/2:70-2.

Descriptors: (*Law enforcement, *Education), Universities, Instructors, Planning, Placement.
Identifiers: *Curricula, Criminal justice.

An effort is described to assist colleges and universities in planning a curriculum in law enforcement and criminal justice, by example of the University of Maryland. In 1954, a proposal for a degree program in law enforcement was instituted at the University of Maryland. Critics insisted that law enforcement personnel did not need formal, advanced education. The proponents of this program refuted the critics. The proposal outlined in detail where to locate the school in the present program and delineated the total curriculum and the special curriculum and catalog descriptions. Criteria and qualifications for instructors were divided into categories to determine hiring priorities and job titles. This proposal was approved by the board of regents on June 20, 1969.

PB-215 715/4 PC$3.00/MF$0.95
RAND Corp., Santa Monica, Calif.
AN X-Y PLATFORM FOR RANDSIGHT-TYPE INSTRUMENTS.
Special rept.,
R. W. Clewett, S. M. Genensky, and H. E. Peterson. Aug 71, 38p R-831-HEW/RC SRS-14-55285-9A
Grant SRS-14-55285

Descriptors: (*Blindness, Reading), (*Visual aids, *Reading), Platforms, Writing, Closed circuit television.
Identifiers: X Y platforms.

A platform is described that can be used to hold and manipulate material that is to be read or written upon in conjunction with the RAND-developed closed-circuit TV system to aid the partially-sighted. The report describes the fabrication and use of this device, and contains suggestions to any manufacturer that is interested in producing large numbers of low-cost devices to enable the partially-sighted to read and write. The device is being used by partially-sighted RAND employees to good effect, and requires only minutes to learn to operate.

PB-216 077/8 PC$3.00/MF$0.95
Florida Div. of Vocational Rehabilitation, Tallahassee.
OPERATIONS RESEARCH. A DEMONSTRATION OF THE VALUE OF AND USE FOR AN OPERATIONS RESEARCH SECTION IN A VOCATIONAL REHABILITATION SETTING.
Final rept.,
H. A. Meyer. Jun 71, 49p SRS-12-55141-4
Grants SRS-RD-2589-G, SRS-12-55141

Descriptors: (*Industrial training, *Rehabilitation), (*Vocational guidance, *Operations research), Projects, Organizations, Objectives, Coordination, Research, Benefit cost analysis.
Identifiers: *Vocational rehabilitation.

A demonstration to determine the potential value of a proposed operations research section in the Florida Division of Vocational Rehabilitation resulted in the formal establishment of an operations research sub-section as an ongoing component of the Planning and Research Section State Office. Its specific objectives are to stimulate and coordinate vocational rehabilitation research activities throughout the state; utilization of research findings in the field of vocational rehabilitation; and conduct of research under the auspices of the Division of Vocational Rehabilitation. (Author)

PB-216 322/8 PC$3.00/MF$0.95
National Auxiliary to Goodwill Industries, Washington, D.C.
THE STATE OF THE ART IN VOLUNTEERING IN REHABILITATION FACILITIES.
Oct 71, 72p SRS-12-55087-3A
Grant SRS-12-55087

Descriptors: (*Rehabilitation, Supervision), (*Social welfare, *Manpower utilization), Surveys, Reviews, Facilities, Classifications, Job analysis, Policies, Management, Attitudes, Performance evaluation.
Identifiers: *Volunteer staff personnel.

A survey (1970-1971) of volunteers in rehabilitation facilities reported on the extended services by agencies utilizing volunteers in 1969. A sample of 695 facilities were surveyed as representative of 2,800 rehabilitation facilities operating at that time. Volunteers were utilized in 66.5 percent of the sample agencies. The different uses of volunteer recognition and reimbursement are discussed along with the attitudes of the administrator and the program development. Included are manuals and materials for volunteer development and for follow-up of new programs. (Author Modified Abstract)

PB-216 323/6 PC$3.00/MF$0.95
Springfield Goodwill Industries, Inc., Mass.
DEMONSTRATING HOW A REHABILITATION CENTER CAN REDUCE COMMUNITY BARRIERS TO EMPLOYMENT OF EPILEPTICS.
Final rept., 1 Mar 68-31 May 71,
Kevin C. Baack, Michael A. Cann, and Merle K. Miller. 31 May 71, 200p SRS-12-55006-1
Grant SRS-1-55006

Descriptors: (*Rehabilitation, *Epilepsy), (*Handicapped workers, Employment), Placement, Vocational guidance, Attitudes, Policies, Community relations, Projects, Centers, Effectiveness.
Identifiers: *Vocational rehabilitation, Employer attitudes, Demonstration programs.

A project concerned with the vocational rehabilitation of institutionalized epileptics and with the barriers to their employment investigated whether educational programs changed the attitudes of employers toward the hiring of epileptics. This was revealed by a resurvey, after in-person visits and the distribution of news-letters, of 250 of 534 businesses which participated in a survey of employer attitudes toward persons with epilepsy. In some instances, the educational program actually made the employers' attitudes generally negative. About a third of the project's clients were able to secure employment at the end of a rehabilitation program. Even if not employed, the typical client developed enough adaptive behavioral skills to move from an institution to a half-way house or to his own apartment. Moreover, the client's self-image improved significantly. (Author)

PB-216 326/9 PC$3.00/MF$0.95
Catholic Univ. of America, Washington, D.C.
THE TRAINING OF RETARDED ADOLESCENTS AND ADULTS IN NONVERBAL SYMBOLIC-PICTURE LOGIC.
Final rept.,
Wolfgang W. Riedel, and Norman A. Milgram. 1971, 15p SRS-15-55114-3
Grant SRS-15-55114
Prepared in cooperation with Temple Univ., Philadelphia, Pa.

Descriptors: (*Rehabilitation, Programmed instruction), (*Cognition, *Mental deficiency), (*Aptitude tests, Symbols), Performance evaluation, Classifications, Analysis of variance, Correlations, Projects, Effectiveness.
Identifiers: Concentration (Psychology), *Trainable retardates, *Educable retardates, Nonverbal symbol picture logic.

Training attempts to teach nonverbal symbolic-picture logic to three mentally retarded groups demonstrated that success in mastering the concepts was relative to the level of intellectual retardation in the subjects. The study utilized a training task devised by Hans G. Furth (1964,1966). The three groups were composed of 18 institutionalized trainable retardates, 20 institutionalized educable retardates, and 53 higher grade educable retardates living at home and attending day school. Program success is reported and scores of the third group were correlated with other measures of cognitive development. (Author Modified Abstract)

PB-216 333/5 PC$3.00/MF$0.95
People-to-People Program, Washington, D.C. Committee for the Handicapped.
SUCCESSFUL DISABLED PERSONS INTERNATIONAL. VOLUME I.
1971, 58p SRS-12-55075-3B
Grant SRS-12-55075

Descriptors: (*Rehabilitation, *Motivation), Reviews, Performance evaluation, Morale.
Identifiers: Handicapped persons, Disabled persons.

Forty-one stories about disabled persons who successfully overcame their handicaps were selected to give needed inspiration to those who find themselves at the beginning of the long task of rehabilitation. The subjects represent a broad spectrum of disabilities from alcoholism through paralysis to blindness. They are typical of the millions who start where they find themselves, do the maximum with what they have, and then go further. (Author)

PB-216 404/4 PC$3.00/MF$0.95
Community Services for the Blind, Atlanta, Ga.
A PROPOSAL FOR ESTABLISHMENT OF A REGIONAL REHABILITATION CENTER FOR THE VISUALLY HANDICAPPED IN THE ATLANTA AREA: REPORT OF A STUDY.
Final rept.,
Robert E. Garren, and Oscar Turk. Jun 71, 56p SRS-RD-1530
Grant VRA-RD-1530-S-64

Descriptors: (*Rehabilitation, *Centers), (*Blindness, Rehabilitation), Surveys, Organizations, Specialized training, Development, Organizing, Methodology, Adjustment (Psychology), Regional planning, Management, Financing, Georgia, Research.
Identifiers: Prevocational skills, *Atlanta (Georgia).

An organization was established in 1962 by the Community Council of the Atlanta area to study the need for and the acceptability of a regional rehabilitation center for the visually handicapped, and to propose a set of criteria for its program and facilities. The committee studied and observed seven rehabilitation centers for the blind in the United States with regard to philosophy, organization, trainees accepted, preadmission and follow-up, admission procedure, specialization, financing, and physical plant. The report contains a summary of the data and the committee's rationale for the type of program and facility best suited to regional needs. A brief history is also given of the development of rehabilitation centers for the blind in the United States. (Author Modified Abstract)

PB-216 408/5 PC$3.75/MF$0.95
Massachusetts Bay Community Coll., Watertown.
THE REHABILITATION SPECIALIST PROGRAM.
Primary rept. Jan 68-Jul 70,
George C. Rogers, and Frances Olrich. Nov 72, 48p
See also PB-216 409.

Descriptors: (*Residential buildings, Rehabilitation), (*Professional personnel, Specialized training), Projects, Reviews, Objectives, Effectiveness, Recommendations, Programmed instruction, Handbooks, Planning, Benefit cost analysis, Urban renewal, Conservation, Job analysis.
Identifiers: *Housing and urban development, *Demonstration projects, *Rehabilitation specialists.

A training program is reported for housing rehabilitation specialists who attempt to save the social fabric of the community by rehabilitating buildings worth saving and demolishing only those buildings beyond repair. In classes held at a local community college, a curriculum was designed by an advisory board from local public agencies; the students were employees of these agencies. The project resulted in a classroom tested training program, and a textbook entitled, the Handbook For Housing Rehabilitation Specialists. (Author Modified Abstract)

PB-216 414/3 PC$3.00/MF$0.95
Maryland Univ., College Park. Project on the Economics of Discrimination.
CURING HIGH UNEMPLOYMENT RATES AMONG BLACKS AND WOMEN,
Barbara R. Bergmann. Oct 72, 20p OEO-LN-1238
Grant OEO-CG-3138

Descriptors: (*Unemployment, Reduction), (*Negroes, Unemployment), (*Females, Unemployment), Employment, Discrimination.

Reduction of the unemployment rate in the United States is dependent on solving the high unemployment of blacks and women.

PB-216 415/0 PC$3.00/MF$0.95
Maryland Univ., College Park. Project on the Economics of Discrimination.
THE ECONOMICS OF WOMEN'S LIBERATION,
Barbara R. Bergmann. 1973, 19p OEO-LN-1232
Grant OEO-CG-3138

Descriptors: (*Employment, Females), (*Females, Discrimination), Socioeconomic status, Salaries, Job analysis, Placement.

A study is presented of the economic forces blocking the way to the development of a world in which women would have equal opportunities for paid work.

PB-216 416/8 PC$3.00/MF$0.95
Maryland Univ., College Park. Project on the Economics of Discrimination.
OCCUPATIONAL SEGREGATION, WAGES AND PROFITS WHEN EMPLOYERS DISCRIMINATE BY RACE OR SEX,
Barbara R. Bergmann. Jan 71, 20p OEO-LN-1235
Grant OEO-CG-3138

Descriptors: (*Employment, Discrimination), (*Negroes, Employment), (*Females, Employment), Salaries, Job analysis, Separation.

There are two pheonomena associated with employment discrimination against blacks: (1) blacks are distributed among occupations differently from whites, even after differences in education are accounted for; and (2) within occupations, whites earn more than blacks do. The same two phenomena are observed as between men and women. It has been customary to analyze the occupational and wage aspects of discrimination as if they were logically separate and their effects additive. In this paper the two aspects are treated in a unified way. The result allows a clearer view of the distributive effects of employment discrimination.

PB-216 504/1 PC$3.00/MF$0.95
Human Resources Center, Albertson, N.Y.
A STUDY OF WORKMEN'S COMPENSATION IN RELATION TO SHELTERED WORKSHOPS.
Final rept.,
Irving M. Friedman. 1971, 67p Rehabilitation-ser-5 SRS-12-55054-2
Contract SRS-12-55054

Descriptors: (*Handicapped workers, *Workmens compensation), (*Insurance, *Rates (Costs)), Surveys, Interviews, Questionnaires, Safety, Payment, Statistical data, Policies.
Identifiers: *Sheltered workshops, *Vocational rehabilitation, Workmens compensation premiums.

A study of excessive costs and the discriminatory attitude of the insurance industry toward workmen's compensation for sheltered workshops found that some workshops had excessive insurance costs which did not result from discrimination in employing the handicapped, but from high accident rates among the non-handicapped. It is recommended that workshop managers become familiar with insurance principles and seek premium reductions by traditional means. Workshop managers and insurance industry representatives need information about each other's fundamentals of operation. (Author)

PB-216 505/8 PC$3.00/MF$0.95
Auburn Univ., Ala. Dept. of Vocational and Adult Education.
DEVELOPMENT OF A MODEL FOR VOCATIONAL EVALUATION OF THE DISADVANTAGED.
Interim rept.,
Julian M. Nadolsky. Sep 71, 84p SRS-12-55140-4A
Grant SRS-12-55140

Descriptors: (*Vocational guidance, Manpower utilization), Models, Rehabilitation, Centers, Facilities, Surveys, Reviews, Data acquisition, Methodology, Statistical analysis.
Identifiers: Vocational rehabilitation centers, *Physically handicapped persons, *Mentally handicapped persons, Manpower development programs, *Culturally disadvantaged groups, *Vocational evaluation.

A study to develop a structural model representative of the practices of vocational evaluators in rehabilitation and manpower oriented facilities concluded that most vocational evaluation programs whether rehabilitative or manpower oriented, hold similar goals and use similar procedures. The model developed pictured the evaluation process as a pyramid representing the logical narrowing of vocational choice through the application of ten basic techniques and procedures. Data were collected from representatives of eighteen randomly selected vocational rehabilitation facilities during a two-day workshop at Auburn University. Data from manpower-oriented facilities were obtained during visits to twenty-two manpower sites. A survey of the literature relevant to vocational evaluation is included with seventy-two references. (Author Modified Abstract)

PB-216 507/4 PC$3.00/MF$0.95
Wisconsin Univ., Madison. Regional Rehabilitation Research Inst.
REHABILITATION CLIENT SUSTENTION: A LONGITUDINAL STUDY,
Dennis A. Gay, Kenneth W. Reagles, and George N. Wright. 1971, 77p Monograph-16-Ser-2 SRS-12-55208-16
Grant SRS-12-55208, SRS-RD-1311-G
Library of Congress Catalog No. 68-64270. Report on Wisconsin Studies in Vocational Rehabilitation. Sponsored in part by Grant SRS-RD-1629.

Descriptors: (*Rehabilitation, Effectiveness), (*Vocational guidance, Rehabilitation), Males, Females, Projects, Interviews, Reviews, Physical fitness, Mental deficiency, Cultural deprivation, Scales (Psychology).
Identifiers: *Vocational rehabilitation, Follow up programs, Physically handicapped persons, Disadvantaged groups.

The report (1971) presents an assessment of the long-term effects of an expanded program of vocational rehabilitation on successfully rehabilitated clients. The subjects for this study were 103 males and 90 females who had completed the expanded rehabilitation program, had been traced in follow-up studies 2 to 4 years after closure, and had not contracted any new disability or vocational handicap since the original closure date. A rehabilitation status scale was developed and used as an indicator of rehabilitation sustention. The report includes a review of relevant literature, a thorough description of the analytic techniques used, and 25 references. (Author Modified Abstract)

PB-216 511/6 PC$3.00/MF$0.95
Kentucky Bureau of Rehabilitation Services, Louisville.
SHORT TERM REHABILITATION OF SOCIAL SECURITY DISABILITY INSURANCE APPLICANTS.
Final rept. 20 Sep 68-30 Sep 71.
Oct 71, 9p SRS-12-55154-4
Contract SRS-12-55154

Descriptors: (*Rehabilitation, Effectiveness), (*Handicapped workers, Employment), Placement, Vocational guidance, Counseling, Projects, Retaining, Kentucky.
Identifiers: *Social security disability insurance, *Short term rehabilitation, *Vocational rehabilitation.

A demonstration (1968-1971) determined the feasibility and effectiveness of early contact, intensive counseling and placement, and follow-up services in the vocational rehabilitation of applicants for Social Security Disability Insurance (SSDI) benefits. A referral closed in denied services generally occurred because the prospective client showed no interest in applying for BRS services. Of 30 successful closures in the experimental group, the majority continued to be employed a year after placement. Referrals accompanied by current and complete medical information were accepted for service more quickly and seemed to respond more enthusiastically at the initial interview than those who required additional medical examinations or reports. (Author Modified Abstract)

PB-216 512/4 PC$3.00/MF$0.95
Virginia Dept. of Vocational Rehabilitation, Richmond, Va.
SHORT TERM REHABILITATION OF SOCIAL SECURITY DISABILITY INSURANCE APPLICANTS.
Final rept. 1 Mar 69-30 Sep 71,
Gordon L. Ownby. 30 Sep 71, 22p SRS-12-55128-3
Grant SRS-12-55128

Descriptors: (*Social welfare, *Employment), Counseling, Vocational guidance, Physical fitness, Services.
Identifiers: Follow up programs, *Employability, *Demonstration projects, Social security disability insurance, Vocational rehabilitation, Disabled persons.

A demonstration project (1968-1971) was to determine the effectiveness of concentrated application of case evaluation, intensive preplacement goal-directed counseling, placement, and follow-up of applicants filing for Social Security Disability Insurance (SSDI) benefits who believed themselves too disabled to undertake gainful employment. (Author Modified Abstract)

PB-216 595/9 PC$3.00/MF$0.95
Case Western Reserve Univ., Cleveland, Ohio. Dept. of Sociology.
PARAPROFESSIONALISM AND REHABILITATION COUNSELING. WORKING PAPER NO. 1. REHABILITATION OCCUPATIONS AND PROFESSIONS IN THE FIELD OF REHABILITATION,
Marvin B. Sussman, Marie R. Haug, and Gwendolyn K. Williams. May 71, 54p SRS-12-55206-5A
Contract SRS-12-55206

Descriptors: (*Rehabilitation, *Professional personnel), Counseling, Medical services, Nursing, Paramedical sciences, Police, Social welfare, Instructors, Specialized training, Community relations, Organizations.
Identifiers: *Paraprofessional personnel, *Career ladders, *Annotated bibliographies.

An annotated bibliography, prepared as part of a study on rehabilitative occupations, addresses itself to the utilization of paraprofessionals in human services. Services included are counseling, medicine, nursing, police work, social work, and teaching. The bibliography includes five areas: General professional characteristics (16 references, 1957-1971); professional/paraprofessional roles and relationships (49 references, 1959-1971); paraprofessional career ladders and training (20 references, 1966-1970); client versus organization identification and bridging role (14 references, 1964-1971), and community issues (19 references, 1965-1971). (Author Modified Abstract)

PB-216 641/1 PC$3.00/MF$0.95
Maynard McDougall Memorial Hospital, Nome, Alaska.
NOME REHABILITATION DEMONSTRATION PROJECT.
Final rept. 1961-1965,
R. H. Kampmeier. 1971, 67p SRS-RD-0823X
Grant OVR-RD-823M
Prepared in cooperation with the Alaska Div. of Vocational Rehabilitation and the Vanderbilt Univ. School of Medicine, Nashville.

Descriptors: (*Rehabilitation, *Projects), (*Social welfare, *Alaska), Eskimos, Populations, Vocational guidance, Public health, Medical services, Classifications, Supervision, Facilities, Problem solving, Organizations, Research, Feasibility.
Identifiers: *Demonstration projects, *Nome (Alaska).

The original project set as its goals a study of the application of rehabilitation techniques and concepts for the solution of a complex health problem for Eskimo and other Alaskan citizens in the Nome area, and an inquiry into the feasibility of the coordination of available services at the community level. The final report summarizes activities of the demonstration project during the three years 1961 to 1964.

PB-216 805/2 PC$3.00/MF$0.95
North Carolina Water Resources Research Inst., Raleigh.
AN INVESTIGATION OF CURRICULA, MATERIALS AND METHODOLOGY FOR TRAINING OPERATORS OF WASTEWATER TREATMENT PLANTS,
James C. Brown. Dec 72, 123p* 76 W73-06024, OWRR-A-054-NC (1)
Contract DI-14-31-0001-3533

Descriptors: (*North Carolina, Sewage treatment), (*Sewage treatment, *Personnel development), Education, Manuals, Methodology, Classifications, Manpower.
Identifiers: *Water pollution abatement.

In view of the crucial roll played by plant operators in the effective operation of costly wastewater treatment plants and the extent of the need for new and retrained personnel, it is proposed that a program of operator training for North Carolina be developed. The study examines the skill and training requirements for four grades of wastewater treatment plant operators recognized under the North Carolina certification law. A detailed list of skills is developed from which a suggested training curricula is proposed. Various methods for training operators are discussed, i.e., short schools, full time training, part time training coordinated with on the job training, correspondence courses, and special subject short courses. Available types of training materials are reviewed and the role of audio-visual materials is discussed. Recommendations are made for the development of an integrated program of operator training in North Carolina.

PB-216 962/1 PC$3.00/MF$0.95
Community and Human Resources Agency, Los Angeles, Calif.
PROJECT HEART.
Final rept. 1969-71,
Richard S. Amador, and Jalayne McCune. Nov 71, 96p SRS-15-55284-9
Grant SRS-15-55284

Descriptors: (*Hospitals, *Employment), (*Mexican Americans, *Manpower utilization), Specialized training, Youths, Projects, Paramedical sciences, English language, Data acquisition, Salaries, Family relations, Socioeconomic status, Vocational guidance, Transportation.
Identifiers: *HEART project, Hospital employment and related training, Dropouts, Paramedical personnel, Disadvantaged groups.

A pilot project (1969-1971) demonstrated that it is feasible to train underemployed Mexican-Americans in poverty areas for the paramedical jobs in hospitals in those areas if English language instruction and prejob training is provided. The project also showed that present methods of collecting data on the manpower needs of these professions is inadequate for the design of such programs and that the low pay customary in these jobs limits the available labor pool to people without dependents. The importance of public transportation to disadvantaged workers was demonstrated to be a primary prerequisite to employing poor people in such programs. (Author Modified Abstract)

PB-217 005/8 PC$3.00/MF$0.95
Kentucky Bureau of Rehabilitation Services, Louisville.
SHORT TERM REHABILITATION OF SOCIAL SECURITY DISABILITY INSURANCE APPLICANTS.
Final rept.,
Joseph H. Voor. Sep 71, 59p SRS-55154-4A
Grant SRS-12-55154
Prepared in cooperation with Virginia Dept. of Vocational Rehabilitation, Richmond, Grant SRS-12-55128; and North Carolina Div. of Vocational Rehabilitation, Winston Salem, Grant SRS12-55158.

Descriptors: (*Rehabilitation, Projects), (*Vocational guidance, Effectiveness), Placement, Employment, Performance evaluation, Counseling, Surveys, Handicapped workers, Kentucky, North Carolina, Virginia.
Identifiers: Short term rehabilitation, Vocational rehabilitation, Social security disability insurance, Demonstration projects.

A tri-state demonstration project (1968-1971) determined the effectiveness of concentrated application of case evaluation and intensive preplacement, goal-directed counseling for the placement of applicants filing for social security disability insurance (SSDI) benefits. The average cost of rehabilitation for the experimental groups was studied. The majority of clients successfully rehabilitated in the experimental groups were still at work 6 months to 1 year after placement. An important factor in the success of short-term vocational rehabilitation of SSDI clients appears to be counselor characteristics.

PB-217 501/6 PC$3.00/MF$0.95
American Association of Community and Junior Colleges, Washington, D.C.

IMPROVING HIGHWAY SAFETY MANPOWER: TRAFFIC ENGINEERING TECHNICIAN PROJECT AT LANSING COMMUNITY COLLEGE.
Final rept. 7 Jul 70-6 May 72,
Andrew S. Korim. 29 Sep 72, 77p DOT-HS-800 800
Contract FH-11-7495

Descriptors: (*Traffic safety, *Programmed instruction), (*Personnel development, *Universities), (*Traffic engineering, Professional personnel), Personnel selection, Project planning, Reviews, Manpower utilization, Students, Financing, Community relations, Recommendations.
Identifiers: *Technicians.

The American Association of Community and Junior Colleges tested an associate degree curriculum to develop traffic engineering technicians. Lansing Community College (Michigan) served as the site for the test. The curriculum was revised to reflect the needs of the students enrolled in the program and the employers of highway safety manpower. The report recommends that the revised traffic engineering technician curriculum be implemented by other community and junior colleges in conjunction with local and state highway safety agencies and employers of traffic engineering technicians.

TT-72-50041 PC$3.00/MF$0.95
National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.
ISRAEL EDUCATION ABSTRACTS. VOLUME 7, 1972.
1973, 86p
Translated by Israel H. Levine. A Selected bibliography of current and past Literature and Materials on the philosophy, policy and practice of education in Israel. Special Enlarged Edition on Advantaging the Disadvantaged in Israeli Education.

Descriptors: (*Education, *Israel), Bibliographies, Abstracts, Cultural deprivation, Translations.
Identifiers: *Culturally disadvantaged groups.

TT-72-51009/01 PC$3.00/MF$0.95
Office of Education, Washington, D.C.
INDIAN EDUCATION MATERIAL. VOLUME 7, NUMBER 1, MARCH 1972. CONTAINS A SPECIAL SECTION: TECHNICAL EDUCATION - I. (ABSTRACT NOS. 1-187).
Annotated quarterly bibliography Jan-Mar 72,
A. Joseph. 1972, 103p
Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Education, *India), Bibliographies, Educational psychology, Finance, Training devices, Students, Instructors, Management.
Identifiers: Adult education, Higher education.

Contents:
Academic achievement;
Administration and organization;
Adult education;
Basic education;
Curriculum;
Education - - general;
Educational psychology;
Educational sociology;
Examination and Evaluation;
Extra-curricular activities;
Finance;
Forms of education;
Guidance and Counselling;
Higher education;
Higher technical and professional education;
History;
Inspection;
Instructional material and aids;
Physical education;
Policy and planning;
Pre-primary education;
Primary education;
Rural education;
Special education;
Statistics;
Student indiscipline;
Student selection;
Teacher education;
Teachers;
Teaching methods;
Tests and measurements;
Technical education.

5J. Psychology (Individual and Group Behavior)

AD-757 040 PC$3.00/MF$0.95
Hawaii Univ Honolulu Dept of Political Science
QUARTERLY TECHNICAL REPORT NO. 18, JULY 1, 1972 - SEPTEMBER 30, 1972.
Research rept.,
R. J. Rummel. Oct 72, 8p
Contract N00014-67-A-0387-0003, ARPA Order-1063
Report on the Dimensionality of Nations Project. See also AD-747 322.

Descriptors: (*Behavior, Factor analysis), (*Asia, Reports), Data processing systems, Interactions, Research program administration.
Identifiers: Dimensionality of nations project, International relations.

During the quarter, A-space factor analyses were initiated. For B-space, all data for all variables for all five years have been completed. Data collection for the Asian Subsystem Study was initiated. Data for approximately 40 behavioral variables for 381 Asian dyads will be collected during the coming quarter. (Author)

AD-757 079 PC$3.00/MF$0.95
Minnesota Univ Minneapolis Center for the Study of Organizational Performance and Human Effectiveness
PERFORMANCE EQUALS ABILITY AND WHAT.
Technical rept.,
Marvin D. Dunnette. Jan 73, 30p Rept no. TR-4009
Contract N00014-68-A-0141-0003

Descriptors: (*Performance (Human), Psychometrics), Theory, Motivation, Job analysis.
Identifiers: Incentives (Psychology).

Results of several research studies designed to evaluate different theories of work motivation are presented. Graen (1967) hired high school girls to do a clerical task and showed that ability measures accounted for far more performance variance than motivational variables such as Expectancy and Instrumentality. Similar results were obtained in investigations by Arvey (1970) and Loehr (1970). In the most comprehensive investigation, Pritchard, Dunnette, and Jorgenson (1972) confirmed deductions from both Equity theory and Expectancy theory, but their results also showed that different conditions of work incentive may facilitate or disrupt the expression of ability differences in work performance. It is argued from results of these several studies that simpler measures rather than more complicated ones need to be investigated as psychologists continue to try to account for the non-ability part of human work performance. Less should be said about 'motivation' per se and more done to learn about the dimensional makeup of the WHAT term in the equation: performance equals ability and what. (Author Modified Abstract)

AD-757 130 Not available NTIS
Defence and Civil Inst of Environmental Medicine Downsview (Ontario)
HANDLING THE HIJACKER,
W. J. McArthur, P. J. Dean, J. R. Carroll, T. Holliday, and R. E. Stokes. 1972, 4p
Availability: Pub. in Aerospace Medicine, v43 n10 p1118-1121 Oct 72.

Descriptors: (*Criminology, Commercial Planes), (*Flight crews, Training), Safety, Anxiety, Psychology, Public relations, Mental disorders, Leadership, Effectiveness.
Identifiers: *Aircraft hijackings.

The primary objective in controlling hijackers must be to prevent them from getting aboard an aircraft and techniques to achieve this objective are being developed. However, for the foreseeable future some hijackers will be able to escape detection and gain entry to aircraft. It is consequently desirable that flight deck crews, cabin attendants and air crew management have practical guidelines to assist them in coping with the in-cabin hijacker when the aircraft is airborne or on the ground. The paper is based on information gained from studies of hijackings which have occurred in the United States and Canada. (Author Modified Abstract)

AD-757 215 PC$3.00/MF$0.95
Wright State Univ Dayton Ohio
A REVIEW OF HUMAN OPERATOR MODELS WITH APPLICATIONS TO TRACKING UNDER ENVIRONMENTAL STRESS.
Final rept. Jun-Sep 70,
George M. Swisher. Feb 73, 80p AMRL-TR-72-48
Contract F33615-70-C-1598

Descriptors: (*Tracking, *Performance (Human)), (*Control systems, Tracking), Mathematical programming, Stress (Physiology), Display systems, Adaptive systems, Nonlinear systems.
Identifiers: Closed loop control systems, Manual control systems.

A review was made of the manual control tracking literature to determine if a sensitive measure of performance under environmental stress existed. The quasilinear describing function schemes, the adaptive variable scheme, the adaptive critical tasks and the optimal control (state variable) schemes were investigated with respect to their use in environmental stressed conditions. The recommended technique for further under environmental stress was the critical task developed by Jex (92). (Author)

AD-757 290 Reprint
Navy Medical Neuropsychiatric Research Unit San Diego Calif
PSYCHOSOCIAL PREDICTORS OF ILLNESS BEHAVIOR AND FAILURE IN STRESSFUL TRAINING,
Richard H. Rahe, Robert J. Biersner, David H. Ryman, and Ransom J. Arthur. Apr 71, 8p Rept no. NMNRU-71-46
Availability: Pub. in Jnl. of Health and Social Behavior, v13 p393-397 Dec 72.

Descriptors: (*Naval training, Diving), (*Stress (Psychology), Diseases), (*Social psychology, Diseases), Training, Anxiety, Psychophysiology, Predictions.
Identifiers: Life changes, *Psychosomatic disorders.

The total score of the Cornell Medical Index (CMI) and a unit scale developed from the Schedule of Recent Experience (SRE) were found to be valid predictors of dispensary visits made during stressful Underwater Demolition Team (UDT) training. The CMI and SRE scores were cross-validated and when combined, were found to significantly increase prediction of dispensary visits. The SRE was found to be more highly associated than the CMI with dispensary visits made by those who eventually quit training because of medical problems, while the CMI was more related to dispensary visits made by those who later voluntarily dropped from training. Those who were medically dropped from training made significantly more dispensary visits and had illnesses and injuries which were nearly twice as severe as those who passed or voluntarily quit training. (Author)

AD-757 336 PC$3.00/MF$0.95
Naval Air Development Center Warminster Pa Crew Systems Dept
A NEW PSYCHOPHYSICAL METHOD.
Phase rept.,
Robert M. Herrick. 20 Sep 72, 32p Rept no. NADC-72176-CS
Contract MF51.524.004

Descriptors: (*Psychophysics, Statistical analysis), Thresholds (Physiology), Psychometrics.
Identifiers: Stimulus (Psychophysiology).

In sensory experiments (e.g., vision, audition) engineers, and experimental psychologists use psychophysical methods to collect data. A typical problem would be a study of the detection of 'pips' on a PPI radar scope. The Method of Limits (ML) and the Method of Constant Stimuli (MCS) are two psychophysical methods commonly used. In this report a description is given of a new method that incorporates the beneficial features of the ML and the MCS. Successive stimuli in a series are presented in random order. The data are treated either as data of a ML experiment or as data of a MCS experiment. The mean threshold is the same as that obtained in the ML or in the MCS. For a given number of judgments, the accuracy of the mean threshold is about the same as the accuracy obtained with the ML. The method eliminates knowledge of the order of the stimuli, and allows evaluation of time-correlated fluctuations in sensitivity. (Author)

AD-757 454 Reprint
Navy Medical Neuropsychiatric Research Unit San Diego Calif
BODY MOVEMENTS DURING SLEEP AS A PREDICTOR OF STAGE CHANGE,
Alan Muzet, Paul Naitoh, Richard E. Townsend, and Laverne C. Johnson. 1972, 7p Rept no. NMNRU-72-22
Availability: Pub. in Psychonomic Science, v29 n1 p7-10 1972.

Descriptors: (*Sleep, *Psychophysiology), Body, Motion, Electrophysiology.

The number of body movements during the ten-minute period of stage 2 just preceding and following SWS and REM sleep were counted in ten males for nine to eleven nights each. There was a significantly greater number of ten-minute period of stage 2 without movement before SWS than after SWS, before REM sleep, and after REM sleep. The last movements in stage 2 preceding SWS occured, in most instances, at least five minutes or more before this transition. These data suggest that body movement in stage 2 may delay the transition from this stage to SWS. (Author)

AD-757 647 PC$3.00/MF$0.95
Naval Air Development Center Warminster Pa Crew Systems Dept
FOVEAL BRIGHTNESS DISCRIMINATION WITH MULTIPLE INCREMENTS AS A FUNCTION OF TIME BETWEEN SUCCESSIVE INCREMENTS.
Phase rept.,
Robert M. Herrick. 22 Jan 73, 70p Rept no. NADC-73025-40

Descriptors: (*Visual perception, Display systems), (*Display systems, Brightness), Thresholds (Physiology), Light, Intensity, Psychophysiology.
Identifiers: *Flicker, Critical frequencies.

In many naval weapons systems, information is provided in the mode of visual displays. In some displays a momentary increase in the intensity of a spot of light serves as a signal to an observer. The increased intensity of the spot may be repeated a number of times, and the observer's job is to detect the signal in the background of visual 'noise'. The visual variables of interest in such displays are the background luminance, the duration of the 'pip' of increased intensity, the time between successive pips, the number of repetitions, and the total observation time. All of these variables have been investigated in the present study. Simple empirical laws have been derived to describe the influence of the variables and the interactions among the variables. (Author Modified Abstract)

AD-757 648 PC$3.00/MF$0.95
Naval Air Development Center Warminster Pa Crew Systems Dept
FOREHEAD SURFACE EMG DURING MENTAL MULTIPLICATION.
Interim rept.,
Richard A. Bromberger. 30 Oct 72, 23p Rept no. NADC-72227-CS

Descriptors: (*Electromyography, *Psychology), Skin, Surfaces, Performance (Human), Muscles, Physiology, Psychophysiology.

The electrical activity of striated muscle, measured at the surface of the skin (surface electromyography or EMG), has been suggested as a correlate of the organism's psychological state. In this experiment forehead EMG was recorded while subjects (Ss) mentally solved multiplication problems varying in difficulty. Difficulty was defined in terms of: (a) time to solve the problem and (b) the percentage of Ss solving the problem correctly. For four Ss the two measures of difficulty were found to correlate. Although forehead EMG was significantly higher during periods when S was instructed to solve a problem than during periods when he was not, no significant relationship between EMG and either measure of task difficulty was found. Additionally, the data did not support the frequently reported progressive increase in EMG from the beginning to the end of a psychological task. (Author)

JPRS-58227 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
A DESCRIPTIVE-ASSOCIATIVE LOGICAL TEST AND ITS PLACE IN PREDICTING ADAPTATION TO CONDITIONS OF A SITUATION OF UNCERTAINTY,
O. N. Kuznetsov, and L. P. Rozova. 14 Feb 73, 14p
Trans. of Voprosy Psikhologii (USSR) n6 p152-158 1972.

Descriptors: (*Isolation, Adaptation), (*Adjustment (Psychology), Isolation), (*Stress (Psychology), Isolation), Personality, USSR, Translations.

The report contains a study of the adaptational properties of the personality which are manifested in prolonged solitude tests in isolation chambers. Thematic apperception and descriptive association logical tests were used.

JPRS-58319 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
CONTEMPORARY STAGE OF DEVELOPMENT OF PSYCHOLOGY IN RSFSR, (RUSSIAN SOVIET FEDERATED SOCIALIST REPUBLIC),
A. A. Smirnov. 26 Feb 73, 21p
Trans. of Sovetskaya Pedagogika (USSR) n12 p69-93 1972.

Descriptors: (*Psychology, USSR), Research, Theories, Children, Education, Translations.

The report contains a summary of investigations of general, children's and pedagogical psychology carried out by scholars of the RSFSR.

JPRS-58359 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
PSYCHO-PHYSIOLOGICAL TESTING AND TRAINING OF PILOTS,
V. Shurlygin. 1 Mar 73, 6p
Trans. from Pravda, Leningrad (USSR) p4, 17 Dec 72.

Descriptors: (*Pilots (Personnel), *Aptitude tests), (*Psychological tests, *Aviation personnel), Psychophysics, Stress (Physiology), Training devices, Personnel selection, USSR, Translations.

The report contains an account of the psychophysiological testing and training of pilots. (Author)

N73-16094 PC$8.50/MF$0.95
Airesearch Mfg. Co., Los Angeles, Calif.
TEKTITE 2 HABITABILITY RESEARCH PROGRAM DAY-TO-DAY LIFE IN THE HABITAT.
D. P. Nowlis. 30 Mar 72, 130p NASA-CR-130034, REPT-71-6192-2
Contract NAS8-25100

Descriptors: *Closed ecological systems, *Habitability, *Human reactions, *Psychological effects, *Tektite project, Human behavior, Marine environments, Underwater communication, Underwater tests.

For abstract, see STAR 11 07.

PB-216 079/4 PC$3.00/MF$0.95
Auburn Univ., Ala. Rehabilitation Services Education.
GUIDELINES FOR THE DEVELOPMENT OF ADJUSTMENT SERVICES IN REHABILITATION,
Richard J. Baker, and Horace W. Sawyer. Sep 71, 184p SRS-12-55140-4B
Grant SRS-12-55140
Prepared in cooperation with Alabama Vocational Rehabilitation Service, Rehabilitation Services Education, Auburn Univ., Ala.

Descriptors: (*Adjustment (Psychology), *Counseling), (*Rehabilitation, *Manuals), Behavior, Transformations, Vocational guidance, Specialized training, Methodology, Motivation, Learning, Records management, Projects.
Identifiers: Behavior modification, *Follow up programs, Innovations, Culturally disadvantaged groups, Lesson plans.

The manual describes the concept and steps in planning and implementation of an adjustment training service as part of a rehabilitation facility. Areas covered are concepts of behavior and adjustment, general techniques of adjustment services, evaluation of the patient, planning and implementation of program, training areas to be undertaken, and the follow-up program. Examples of course outlines, lesson plans, information record forms, and training methods are included. A bibliography of 188 entries is keyed to subject areas. (Author)

PB-216 163/6 PC$6.00/MF$0.95
Indiana Univ., Bloomington. Dept. of Economics.
ECONOMICS OF JOB SEARCH: A BIRACIAL ANALYSIS OF JOB SEARCH BEHAVIOR OF URBAN MALE YOUTH AGES 18-22.
Final rept.,
Stanley P. Stephenson, Jr. Jan 73, 160p* DL-91-18-72-02-1
Grant DL-91-18-72-02

Descriptors: (*Employment, Searching), (*Males, *Behavior), Econometrics, Hypotheses, Males, Youths, Urban areas, Unemployment, Social psychology, Industrial psychology, Negroes, Caucasians, Economic models.
Identifiers: *Job search behavior.

The study presents and tests an econometric model of job search behavior for youth. The main hypothesis is that differences in search behavior help account for youth-adult unemployment differences and that within the youth group, black-white unemployment and earnings differentials

can be partially explained by job search behavior. (Author)

PB-216 413/5 PC$3.75/MF$0.95
Maryland Univ., College Park. Project on the Economics of Discrimination.
URBAN CONFLICT AS A CONSTRAINT ON MAYORAL LEADERSHIP: LESSONS FROM GARY AND CLEVELAND,
Charles H. Levine, and Clifford Kaufman. Nov 72, 46p* OEO-LN-1240
Grant OEO-CG-3138
Prepared in cooperation with Wayne State Univ., Detroit, Mich. Presented at Workshop on Mayoral Leadership, Northeast Political Science Association Annual Meeting, Amherst, Mass., 10-11 Nov 72.

Descriptors: (*Public administration, *Conflict), (*Leadership, *Municipalities), Executives, Constraints, Community relations, Models, Organizations, Group dynamics, Reviews, Urban areas, Negroes.
Identifiers: *Mayors, Coalitions, *Gary (Indiana), *Cleveland (Ohio).

Limitations in the literature on mayoral leadership raise several questions which are considered: (1) What forms of mayoral leadership can be identified. (2) Under what conditions is an executive-centered coalition an appropriate and effective strategy for mayoral leadership. (3) In high cleavage communities, what forms of mayoral leadership are appropriate and effective. The paper develops an alternative framework for mayoral leadership in polarized communities and examines the cases of Gary and Cleveland, where black mayors have served for a substantial period of time.

PB-216 417/6 PC$5.45/MF$0.95
Dunlap and Associates, Inc., Darien, Conn.
DRUG ABUSE AND DRIVING PERFORMANCE.
Final rept., 30 Jun 71-31 Oct 72,
Richard D. Blomberg, and David F. Preusser. Oct 72, 114p* ED-72-23 DOT-HS-800 754
Contract DOT-HS-099-1-184

Descriptors: (*Motor vehicle operators, *Drug addiction), Narcotics, Traffic safety, Performance evaluation.
Identifiers: *Drug abuse, Methadone, Heroin.

Data on 1562 methadone maintenance patients in New York State were gathered through face-to-face interviews. A control group of 1059 people was constructed by asking the experimentals to volunteer names of non-addicted friends. State driver records for 718 experimentals and 579 controls were obtained and analyzed. In general, experimental subjects were no worse drivers than the controls for the entire period covered by the driver records. This was so despite the fact that experimentals estimated their mileage to be at or above the national average throughout their abuse of non-narcotic and narcotic drugs and during their methadone treatment. It was also found that drug abusers who drive are likely to drive immediately after using drugs.

PB-217 100/7 PC$3.00/MF$0.95
Illinois Univ., Champaign. Dept. of Psychology.
ILLINOIS STUDIES OF THE ECONOMICALLY DISADVANTAGED: A CONTENT ANALYTIC STUDY OF INTERRACIAL CONFLICT-PRODUCING SITUATIONS AND ROLES.
Technical rept.,
Tulsi B. Saral. Jul 71, 85p TR-9 SRS-55175-51
Grant SRS-12-55175

Descriptors: (*Ethnic groups, *Conflict), Attitudes, Classifications, Negroes, Caucasians, Interpersonal relations, Sociopsychological surveys, Socioeconomic status, Statistical analysis, Roles (Behavior), Documents.
Identifiers: *Disadvantaged groups, Black white interactions.

A study is presented of black-white relations as revealed by black literature written for a black audience. The dominance pattern prevailing in society was depicted in the literature. Whites were shown as patronizing and pleasant when they elicited from Blacks behaviors they liked, such as subordination, but hostile and resentful when faced with defiant or other disliked behaviors. Interpersonal interactions were rated on a specially constructed scale by psycholinguistics students and statistically analyzed by type of role pair, direction of interaction, verb category, semantic features, and intimacy and status. Frequency distribution tables and rating scales are included.

5K. Sociology

AD-757 020 PC$3.00/MF$0.95
Florida State Univ Tallahassee Dept of Statistics
SOCIOLOGY WANTS MATHEMATICS.
Technical rept.,
I. Richard Savage. Jan 73, 42p Rept nos. FSU-Statistics-M247, TR-71-ONR
Contract N00014-67-A-0235-0006

Descriptors: (*Sociology, Mathematics), Decision theory, Stochastic processes, Mathematical models, Problem solving, Social psychology.
Identifiers: *Applications of mathematics, Markov chains.

The current sociological literature contains many examples where the verbal presentation cries out for a formal (mathematical) structure. There are other examples where sociological writings have explicitly used mathematical models which need clarification and analysis. Twelve examples are given of these wants of mathematics. These examples can serve as an introduction for sociologists and mathematicians of the potential role of mathematics in sociology. Some of the examples suggest major research efforts, such as, the further development of social psychology by more complete formal models and other examples suggest major developmental programs, such as, a decision theoretic approach to population prediction. (Author Modified Abstract)

COM-71-80010 PC-GPO/MF$55.40-NTIS
Bureau of the Census, Washington, D.C.
CENSUS OF POPULATION: 1970. GENERAL SOCIAL AND ECONOMIC CHARACTERISTICS.
Final repts.
1971-72, 53 issues CENSUS-70-PC (1)-C01–CENSUS-70-PC (1)-C53
Paper copy available from GPO $121.75/set of 53 reports as C3.223/7:970.

The reports present statistics from the 1970 Census of Population on social and economic characteristics of the population. Data are presented on age, nativity, place of birth, and parentage;
MOTHER TONGUE;
Spanish heritage;
YEAR MOVED INTO PRESENT HOUSE AND RESIDENCE IN 1965;
SCHOOL ENROLLMENT AND YEARS OF SCHOOL COMPLETED;
VOCATIONAL TRAINING;
VETERAN STATUS;
MARITAL HISTORY;
FAMILIES AND THEIR COMPOSITION;
FERTILITY;
WORK DISABILITY;
EMPLOYMENT STATUS;
WEEKS WORKED IN 1969;
ACTIVITY FIVE YEARS AGO;
PLACE OF WORK;
MEANS OF TRANSPORTATION TO WORK;
OCCUPATION, INDUSTRY, AND CLASS OF WORKER;
INCOME;
AND POVERTY STATUS. Items such as sex and race are also presented for the purpose of cross-classifications. Statistics are shown by counties, standard metropolitan statistical areas, urbanized areas and urban places for most of the subjects. For prices of individual reports, see below:
CENSUS-70-PC (1)-C53. Puerto Rico. Oct 72, 516p PC-GPO$1.00, MF$0.95-NTIS.

PB-214 700/7 16mm microfilm $162.00 or $242.00
National Center for Health Statistics, Rockville, Md. Div. of Vital Statistics.
VITAL STATISTICS OF THE UNITED STATES: OFFICIAL FINAL DATA ON BIRTHS, DEATHS (INCLUDING FETAL DEATHS), MARRIAGES AND DIVORCES.
1972, 40 16mm microfilm reels or cartridge
HSMHA-NCHS-72-2-A
Individual reels available for $6.00; individual cartridges (specify type) available for $8.00.
Specify reel or cartridge type: 16mm microfilm reel, PB-214 700-P, $162.00; 3M cartridge, PB-214 700-M, $242.00, Recordak cartridge, PB-214 700-R, $242.00; or Thread Easy Magazine, PB-214 700-T, $242.00.

Descriptors: (*Vital statistics, *United States), (*Mortality, Statistical data), (*Birth, Statistical data), Census, Demography, Marriage, Malignant neoplasms, Infants, Tables (Data), Adults, Accidents, Motor vehicle accidents.
Identifiers: Divorce.

The reports present statistical data concerning:
birth-registration area;
BIRTH, STILLBIRTH AND INFANT MORTALITY;
DEATH-REGISTRATION AREA;
VITAL STATISTICS OF THE United States beginning with 1937;
DEATHS BY CAUSE;
BIRTHS BY AGE OF PARENTS;
MOTOR VEHICLE FATALITIES;
LIFE TABLES;
GEOGRAPHIC DETAIL FOR SELECTED VARIABLES;
AND MARRIAGE AND DIVORCE UP TO 1950.

PB-214 741 16mm microfilm $102.00 or $152.00
National Center for Health Statistics, Rockville, Md. Div. of Vital Statistics.
VITAL STATISTICS OF THE UNITED STATES. MORTALITY STATISTICS, 1900-1936; BIRTH STATISTICS, 1915-1940; VITAL STATISTICS OF THE UNITED STATES, 1937-1968.
1972, 25 16mm microfilm reels or cartridges
HSMHA-NCHS-72-2-B
Individual reels available for $6.00; individual cartridges (specify type) available for $8.00; also available in set of 40 16mm microfilm reels or cartridges (specify type) as PB-214 700, $162.00 or $242.00.
Available in set of 25 16mm microfilm reels or cartridges (specify type): reel, PB-214 714-P, $102.00; 3M cartridge, PB-214 741-M, $152.00; Recordak cartridge, PB-214 741-R, $152.00; or Thread Easy Magazine, PB-214 741-T, $152.00.

The reports present statistical data concerning:
birth-registration area;
BIRTH, STILLBIRTH AND INFANT MORTALITY;
DEATH-REGISTRATION AREA;
AND VITAL STATISTICS OF THE United States beginning with 1937. Individual reports are also available as follows:
HSMHA-NCHS-72-2-01. Mortality Statistics, 1900-1907, Reel Number 1, 1 reel $6.00, or cartridge (specify), $8.00. **PB-214 701/5**
HSMHA-NCHS-72-2-02. Mortality Statistics, 1900-1907, Reel Number 2, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 702/3**
HSMHA-NCHS-72-2-03. Mortality Statistics, 1908-1911, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 703/1**
HSMHA-NCHS-72-2-05. Mortality Statistics, 1915-18, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 705/6**

HSMHA-NCHS-72-2-06. Mortality Statistics, 1919-22, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 706/4**
HSMHA-NCHS-72-2-07. Mortality Statistics, 1923-26, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 707/2**
HSMHA-NCHS-72-2-08. Mortality Statistics, 1927-30, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 708/0**
HSMHA-NCHS-72-2-10. Birth Statistics, 1915-1922, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 709/8**
HSMHA-NCHS-72-2-10. Birth Statistics, 1915-1922, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 710/6**
HSMHA-NCHS-72-2-11. Birth Statistics, 1923-29, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 711/4**
HSMHA-NCHS-72-2-12. Birth Statistics, 1930-40, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 712/2**
HSMHA-NCHS-72-2-13. Vital Statistics of the United States, 1937-39, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 713/0**
HSMHA-NCHS-72-2-14. Vital Statistics of the United States, 1940-42, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 714/8**
HSMHA-NCHS-72-2-15. Vital Statistics of the United States, 1943-45, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 715/5**
HSMHA-NCHS-72-2-16. Vital Statistics of the United States, 1946-48, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 716/3**
HSMHA-NCHS-72-2-17. Vital Statistics of the United States, 1949-50, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 717/1**
HSMHA-NCHS-72-2-18. Vital Statistics of the United States, 1951-53, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 718/9**
HSMHA-NCHS-72-2-19. Vital Statistics of the United States, 1954-56, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 719/7**
HSMHA-NCHS-72-2-20. Vital Statistics of the United States, 1957-58, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 720/5**
HSMHA-NCHS-72-2-21. Vital Statistics of the United States, 1959-60, 1 reel, $6.00, or cartridge (specify) $8.00. **PB-214 721/3**
HSMHA-NCHS-72-2-22. Vital Statistics of the United States, 1961-62, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 722/1**
HSMHA-NCHS-72-2-23. Vital Statistics of the United States, 1963-64, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 723/9**
HSMHA-NCHS-72-2-24. Vital Statistics of the United States, 1965-66, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 724/7**
HSMHA-NCHS-72-2-25. Vital Statistics of the United States, 1967-68, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 725/4**

PB-214 742 16mm microfilm $62.00 or $92.00
National Center for Health Statistics, Rockville, Md. Div. of Vital Statistics.
VITAL STATISTICS OF THE UNITED STATES. SPECIAL REPORTS, 1934. U.S. LIFE TABLES, 1890-1961. MARRIAGE AND DIVORCE 1867--1906, 1916, 1922-32, 1944-48, 1939-50.
1972, 15 16mm microfilm reels or cartridges
HSMHA-NCHS-72-2-C
Individual reels available for $6.00; individual cartridges (specify type) available for $8.00; also available in set of 40 16mm microfilm reels or cartridges (specify type) as PB-214 700, $162.00 or $242.00.
Available in set of 15 16mm microfilm reels or cartridges (specify type): reel, PB-214 742-P, $62.00; 3M cartridge, PB-214 742-M, $92.00; Recordak cartridge, PB-214 742-R, $92.00; or Thread Easy Magazine, PB-214 742-T, $92.00.

The reports present statistical data concerning:
deaths by age of parents;
BIRTHS BY AGE OF PARENTS;
MOTOR VEHICLE FATALITIES;
LIFE TABLES;
AND MARRIAGE AND DIVORCE UP TO 1950. Individual reports are also available as follows:

HSMHA-NCHS-72-2-26. Special Reports, 1937-1939, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 726/2**
HSMHA-NCHS-72-2-27. Special Reports, 1937, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 727/0**
HSMHA-NCHS-72-2-28. Special Reports, 1938, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 728/8**
HSMHA-NCHS-72-2-29. Special Reports, 1939, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 729/6**
HSMHA-NCHS-72-2-30. Special Reports, 1939-40, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 730/4**
HSMHA-NCHS-72-2-31. Special Reports, 1941-42, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 731/2**
HSMHA-NCHS-72-2-32. Special Reports, 1943-44, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 732/0**
HSMHA-NCHS-72-2-33. Special Reports, 1944-46, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 733/8**
HSMHA-NCHS-72-2-34. Special Reports, 1947-48, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 734/6**
HSMHA-NCHS-72-2-35. Special Reports, 1948-52, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 735/3**
HSMHA-NCHS-72-2-36. Special Reports, 1949-55, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 736/1**
HSMHA-NCHS-72-2-37. Special Reports, 1957-65, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 737/9**
HSMHA-NCHS-72-2-38. Special Reports, 1958-63, U.S. Life Tables, 1890-1951, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 738/7**
HSMHA-NCHS-72-2-39. U.S. Life Tables, 1959-61, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 739/5**
HSMHA-NCHS-72-2-40. Marriage and Divorce 1867-1906, 1916, 1922-32, 1944-48, 1939-50, 1 reel, $6.00, or cartridge (specify), $8.00. **PB-214 740/3**

PB-215 424/3 PC$3.00/MF$0.95
Law Enforcement Assistance Administration, Washington, D.C. Organized Crime Program Div.
THE ROLE OF STATE ORGANIZED CRIME PREVENTION COUNCILS.
Oct 70, 64p

Descriptors: (*Crimes, Prevention), (*Organizations, State government), Standards, Criminology, Law enforcement, Texas, Georgia, Planning.
Identifiers: *Organized crime.

The report concerns the relationship of the council concept to the Safe Streets Act and establishment of guidelines for the organization and funtion of such councils. An organized crime prevention council is seen as one of the most useful tools available to a state in developing and implementing a comprehensive strategy against organized crime. A number of states have formed such councils and results have been encouraging. The Law Enforcement Assistance Administration encourages the creation of these councils, and in this publication establishes standards for their structure and duties. One of the main tasks of a state council is defining the organized crime problem within the state's borders. Strategies can then be planned to combat the problem. For example, a statewide organized crime intelligence capability might be created, or special prosecutory and investigative units might be trained. The appendices contain the text of the Federal Legislation which authorized the councils and materials on the operations of the Texas and Georgia Councils.

PB-215 435/9 PC$3.00/MF$0.95
Kiddie Kamp Corp., Boston, Mass.
PREVENTION OF POTENTIAL JUVENILE DELINQUENCY THROUGH CAMPING.
Final rept.
Apr 71, 133p SRS-15-55013-1
Grant SRS-15-55013

Descriptors: (*Juvenile delinquency, Prevention), (*Recreation, Attitudes), Schools, Adjustment (Psychology), Group dynamics, Motivation, Children.
Identifiers: *Camping.

A 2-year demonstration project, to determine whether a short-term (30 days) summer camp experience could contribute to prevention of juvenile delinquency, found that camping induced positive attitudinal change and improved adjustment to school. The project involved 200 adolescent boys from varied social backgrounds who were selected on evidence of anti-social behavior and potential for dropping out of school. In addition, information was obtained from a group of nonproject campers and non-campers in order to evaluate their summer experiences for purposes of comparison. Actual program methodology emphasized group dynamics and sensitivity training in organized camping activities and staff-camper relations. Program evaluation formed around data collected before, during, and after camp sessions; camper self-report schemes and counselor observation sheets were analyzed to measure change. Statistical analysis of pre- and post-measures showed positive change in a camper's attitudes toward self, peer group, and authority.

PB-215 636/2 PC$4.50/MF$0.95
Pennsylvania State Univ., University Park. Div. of Community Development.
USING CORRECTIONAL OFFICERS IN PLANNED CHANGE.
Final rept.,
David Duffee. Oct 72, 78p*
Grant LEAA-NI-71-115

Descriptors: (*Criminology, Specialized training), (*Group dynamics, *Management), Group psychology, Roles (Behavior), Social change, Problem solving, Social communication.
Identifiers: Correctional institutions, Correctional officers.

The project tests the hypothesis that the involvement of correctional officers in a research-oriented group dealing with the process of changing goals within the correctional institution will create a more flexible and constructive guard subculture. A group of seven correctional officers was brought together in a minimum security facility and given research tasks concerning various elements of the organization and goals of the prison community. This group technique did prove effective in developing a problem-solving milieu for correctional officers and an increased awareness on their part of the problems of individual inmates. It did not, however, prove an effective means of opening useful communication channels between the correctional officers and their superiors.

PB-215 711/3 PC$3.00/MF$0.95
District of Columbia Metropolitan Police Dept., Washington.
CRIME REDUCTION THROUGH AERIAL PATROL.
Final rept.
1973, 117P LEAA-NI-70-089
Grant LEAA-NI-70-089

Descriptors: (*Crimes, Reduction), (*Helicopters, Law enforcement), Police, Aerial reconnaissance, Populations, Expenses, Effectiveness, Weather.

A study was made to assess how effectively helicopters can be used for aerial patrol in a more densely populated community with more severe weather conditions than the Los Angeles area. Included in the report are discussions on helicopter equipment and maintenance, pilot training, crime assist and deterrence capabilities of helicopters and the cost of an aerial patrol program.

PB-216 072/9 PC$3.00/MF$0.95
Florida Univ., Gainesville. Regional Rehabilitation Research Inst.
INFORMATIONAL RESOURCES FOR AIDING RESEARCH UTILIZATION BY REHABILITATION AND SOCIAL SERVICE WORKERS.
Final rept.,
John E. Muthard, and Linda M. Crocker. Mar 72, 24p SRS-22-55144-4
Grant SRS-RD-3080, SRS-22-55144

Descriptors: (*Rehabilitation, *Information systems), (*Social welfare, *Documents), Research, Project planning, Objectives, Methodology, Centers, Counseling, Directories, Indexes (Documentation), Professional personnel, Consultants, Manuals, Subject indexing, Bibliographies.
Identifiers: *Management information systems, *Follow up programs, Social service workers.

An SRS project (1970-1972) at the University of Florida-Regional Rehabilitation Research Institute, commissioned to devise a means to locate and to organize informational materials for rehabilitation and social service workers, produced the following publications: Rehabilitation Research and Demonstration Projects 1955-1970; Directory of Rehabilitation Consultants 1971; Guide to Information Centers for Workers in the Social Services 1971. The final report of the project describes the purposes, methods, goals, products, and follow-up findings for each book. (Author)

PB-216 074/5 PC$3.00/MF$0.95
Saint Andrews Presbyterian Coll., Laurinburg, N.C.
STUDENT AIDES FOR HANDICAPPED COLLEGE STUDENTS.
Final rept.,
Robert M. Urie, C. Dwight Auvenshine, and Rodger W. Decker. 1 Jul 71, 169p SRS-12-55156-4
Grant SRS-12-55156

Descriptors: (*Students, Services), Universities, Social welfare, Performance evaluation, Projects, Effectiveness.
Identifiers: *Physically handicapped persons, *Student aides.

A 6-year project investigated the use of student aides in assisting selected physically disabled students in a small 4-year liberal arts college, to demonstrate that a comprhensive range of facilities, programs, and services would result in a satisfactory academic, physical, psychological, social, and vocational experience for both the physically disabled and their aides. The sample student group consisted of 29 male physically disabled, 32 male aides, 33 female physically disabled, and 72 female aides. The professional staff consisted of a project director and a registered nurse who supervised the aides. A research and evaluation team served both a surveillance and an expert resource function. (Author)

PB-216 083/6 PC$6.00/MF$0.95
National Park Service, Denver, Colo. Historic Preservation Team.
YELLOWSTONE NATIONAL PARK. FORT YELLOWSTONE HISTORIC STRUCTURE REPORT.
Basic data study.
David G. Battle, and Erwin N. Thompson. May 72, 474p FNP-PHH-73-113

Descriptors: (*National parks, *History), Public land, Architecture, Construction, Fortifications, Military facilities, Reviews, Bibliographies.
Identifiers: *Yellowstone National Park, Cheyenne (Wyoming).

The report is divided into a historical data section and an architectural data section. It contains a brief history of construction at Mammoth Hot Springs. This includes a description of the headquarters of Superintendent Philetus W. Norris; appointed the second Superintendent of Yellowstone in 1878, Camp Sheridan, and Fort Yellowstone. The brief histories are given of every military or military-associated structure standing or demolished, as well as some of the historical highlights and identification of personalities of importance in the history of the post. (Author Modified Abstract)

PB-216 321/0 PC$3.00/MF$0.95
Northeastern Univ., Boston, Mass. New England Rehabilitation Research Inst.
THE REHABILITATION OF THE YOUNG EPILEPTIC. DIMENSIONS AND DYNAMICS,
George J. Goldin, Sally L. Perry, Reuben J. Margolin, Bernard A. Stotsky, and June C. Foster. 1971, 135p SRS-12-55011-1E
Grant SRS-12-55011
International Standard Book no. 0-669-81380-X. Library of Congress Catalog Card no. 73-179651. Pub. as Northeastern Univ. Studies in Rehabilitation no. 12.

Descriptors: (*Rehabilitation, *Epilepsy), (*Youths, Rehabilitation), Psychosociological surveys, Medical records, Organizations, Demography, Education, Family relations, Age, Physical fitness, Mental deficiency, Data acquisition, Parent child relations, Recommendations, Community relations.

A survey of demographic, medical, educational, recreational, vocational, parental, and social variables in the psychosocial development of epileptic adolescents found that early age at onset of seizures was significantly related to later difficulties in social and emotional adjustment. Other medical variables appeared to be less important than parental handling and aspects of family life. More psychosocial and psychoeducational problems were noted among epileptics who had additional physical and mental disabilities. Data were derived from a survey of 203 parents of adolescent epileptics. (Author Modified Abstract)

PB-216 324/4 PC$3.00/MF$0.95
Kentucky Dept. of Economic Security, Frankfort.
COMPARATIVE SURVEY OF UNDERGRADUATE SOCIAL WELFARE FACULTY AND CURRICULUM DEVELOPMENT IN SELECTED KENTUCKY FOUR-YEAR COLLEGES AND UNIVERSITIES: 1961-1971,
Dianna McClure, and Annette Stephenson. May 71, 81p SRS-11-57028-4F
Contract SRS-11-57028

Descriptors: (*Social welfare, *Specialized training), Universities, Manpower utilization, Comparison, Questionnaires, Surveys, Projects, Instructors.
Identifiers: *Curriculum development, *Social work.

Two surveys conducted in 1969 and updated in 1971 yield information from 20 Kentucky colleges and universities on current programs, future plans, and potential faculty for social work and social welfare undergraduate education. All responses were reported in a question-by-question tabulation allowing a comparison among institutions and an assessment of the extent of such education in 1971. (Author)

PB-216 325/1 PC$3.00/MF$0.95
Institute for Interdisciplinary Studies, Minneapolis, Minn.
EVALUATION OF THE EMERGENCY SOCIAL SERVICES.
Final rept.,
Joseph B. Murphy, Lynn A. Evans, and Lanny J. Morrison. Jul 71, 66p SRS-11-57034-52
Contract SRS-11-57034

Descriptors: (*Social welfare, *Services), Effectiveness, Surveys, Management, Interfaces, Organizations, Minnesota.
Identifiers: *Emergency social services, *Minneapolis (Minnesota).

An evaluation of the Emergency Social Services (ESS) Project in the Pilot City Health Center of Minneapolis found that, despite difficulties and lack of clarification on interface with other community service agencies, ESS had met the need for a county-wide social services agency and was particularly successful in alleviating clients' crises. The evaluation team notes what improvements could be made, and explored a number of problem areas, particularly the administrative conflicts between the ESS administration and the administration of the Pilot City Core Services. (Author Modified Abstract)

PB-216 330/1 PC$3.00/MF$0.95
Columbia Univ., New York. Horace Mann-Lincoln Inst.
ETHNIC SUCCESSION AND NETWORK FORMATION IN ORGANIZED CRIME.
Final rept.,
Francis A. J. Ianni, Suzy Fisher, and Jeffrey Lewis. Oct 72, 246p LEAA-NI-71-076-G
Grant LEAA-NI-71-076-G

Descriptors: (*Crimes, *Ethnic groups), (*Social organization, Crimes), Community relations, Negroes.
Identifiers: *Organized crime, Puerto Ricans.

The study examines the process of ethnic succession in organized crime syndicates, developing a model of how new member groups organize themselves to achieve the goals shared by members and how these groups develop and enforce rules to maximize their criminal efforts. Results of the study included: documentation of the process of ethnic succession in organized crime, analysis of patterns of social relationships in newly emerging criminal groups in relation to the society, the community and other groups and development of preliminary models of the functioning of newly formed organized criminal groups.

PB-216 335/0 PC$3.00/MF$0.95
Flame of Hope, Inc., Wellesley, Mass.
FLAME OF HOPE - NEW APPROACHES TO COMPETITIVE EMPLOYMENT OF THE MENTALLY RETARDED THROUGH PROPRIETARY PRODUCTS.
Final rept. 1968-71.
1971, 117P SRS-12-55008-1
Grant SRS-12-55008

Descriptors: (*Mental deficiency, *Employment), Rehabilitation, Candles, Fabrication, Sales, Productivity, Industrial relations.
Identifiers: Perfume, *Flame of Hope project.

The report details the experience of Flame of Hope (a non-profit, national marketing corporation) in developing production plans, mounting publicity, producing guidelines, and handling marketing for products made by mentally retarded clients in sheltered workshops. Opportunities for demonstrating the capabilities of mentally retarded clients were increased through the organized national marketing activities and through quality products. (Author)

PB-216 506/6 PC$3.00/MF$0.95
Wisconsin Univ., Madison. Regional Rehabilitation Research Inst.
THE IMPACT OF AN EXPANDED VOCATIONAL REHABILITATION PROGRAM UPON INTRA-AGENCY PROCESSES AND PROCEDURES,
Solly Katz, George N. Wright, and Kenneth W. Reagles. 1971, 74p Monograph-14-Ser 2 SRS-12-55208-50-14
Grant SRS-12-55208, SRS-RD-1311-G
Library of Congress Catalog No. 68-64270. Report on Wisconsin Studies in Vocational Rehabilitation. Sponsored in part by Grant SRS-RD-1629.

Descriptors: (*Rehabilitation, *Services), (*Projects, Expansion), Organizations, Counseling, Vocational guidance, Females, Caucasians, Benefit cost analysis, Wisconsin.
Identifiers: *Culturally disadvantaged groups, Disabled persons, Handicapped persons, Mothers.

An assessment was made of the impact of expanding rehabilitation services of a state vocational agency to clients with cultural disabilities. The effects of agency personnel, client characteristics, caseload characteristics, counselor services, and patterns of purchased services were studied. The expanded program served an increased number of disabled-handicapped and resulted in more time for services to clients at no greater cost per case using standard rehabilitative methods. The culturally disadvantaged in this study were predominantly Caucasian women with dependent children. (Author Modified Abstract)

PB-216 510/8 PC$3.00/MF$0.95
North Carolina Div. of Vocational Rehabilitation, Raleigh.
SHORT-TERM REHABILITATION OF SOCIAL SECURITY DISABILITY INSURANCE APPLICANTS.
Final rept. 20 Sep 68-30 Sep 71,
C. P. Truitt. Sep 71, 29p SRS-55158-4
Grant SRS-12-55158

Descriptors: (*Rehabilitation, *Vocational guidance), Counseling, Placement, Services, Cost analysis, Statistical data, Reviews, North Carolina.
Identifiers: Short term rehabilitation, Social security disability insurance, Disabled persons, Vocational rehabilitation.

A project (1968-1971) determined the feasibility and effectiveness of intensive short-term counseling, guidance, and placement services in the vocational rehabilitation of applicants for Social Security Disability Insurance (SSDI) benefits. Two experimental group counselors activated a number of referrals, transferred some who developed a need for long-term or expensive services to other counselors, and closed two groups. Statistical data are presented. (Author Modified Abstract)

PB-216 596/7 PC$3.00/MF$0.95
Brookings Institution, Washington, D.C.
INTERNATIONAL PERSPECTIVES ON SOCIAL WELFARE RESEARCH: A REPORT OF AN INTERNATIONAL SYMPOSIUM, MAY 23-JUNE 9, 1971.
Final rept.,
A. Eric Bubeck. Mar 72, 178p SRS-22-55333-3
Grant SRS-22-55333

Descriptors: (*Social welfare, *Research), (*Meetings, Social welfare), Projects, Policies, Information systems, International relations, Organizations, Planning, Africa, Europe, South America, Asia, Recommendations.
Identifiers: *International symposia, Social indicators.

Proceedings of the 1971 international symposium on social welfare research show a concern for the lack of international data in the field of social welfare and a need for exchange of such information. Papers and discussions at the Symposium included reports from individual countries and discussion of such topics as the need for social indicators, building of a data base, the role of social welfare in policy-making, and the role of international bodies such as the United Nations. The symposium concluded with a series of proposals for furthering the international exchange of social welfare information and experiences.

PB-216 597/5 PC$6.00/MF$0.95
International Association of Rehabilitation Facilities, Washington, D.C.
RESEARCH UTILIZATION IN REHABILITATION FACILITIES.
Final rept.,
Ralph N. Pacinelli. Oct 71, 365p SRS-22-55091-3
Grant SRS-22-55091

Descriptors: (*Rehabilitation, Facilities), Personnel, Development, Utilization, Community relations, Performance evaluation, Vocational guidance, Classifications, Cost effectiveness, Recommendations, Social welfare.
Identifiers: *Vocational rehabilitation, *International symposia, *Disadvantaged groups, Paraprofessional personnel, Social workers.

The report includes 33 papers presented at the International Conference on Research Utilization in Rehabilitation Facilities and deals with six topics: support personnel, facility development and utilization, community organization, vocational assessment, the homebound, and cost effectiveness in rehabilitation. Eleven recommendations were agreed upon by the participants. (Author Modified Abstract)

PB-216 607/2 PC$6.00/MF$0.95
Bureau of Economic Analysis, Washington, D.C.
POPULATION AND ECONOMIC ACTIVITY IN THE UNITED STATES AND STANDARD METROPOLITAN STATISTICAL AREAS HISTORICAL AND PROJECTED 1950-2020.
Jul 72, 544p*

Descriptors: (*Populations, *United States), (*Income, Statistical data), (*Employment, Statistical data), (*Water quality, Management planning), Predictions, Government policies, Economic factors.
Identifiers: Standard metropolitan statistical areas.

Projections of income, employment, and population from 1970 to 2020 are presented. These projections can serve in the development of water quality management plans to ways. They enable State and local planners to make rational decisions concerning the sizing and staging of future treatment facilities. In addition, they can serve as a frame of reference within which to evaluate the social and economic impacts that may be associated with water quality management alternatives.

PB-216 998/5 PC$4.50/MF$0.95
Saint Lawrence County Planning Board, Potsdam, N. Y.
AN INVENTORY OF PROBLEMS, NEEDS AND POTENTIALS, HOUSING ST. LAWRENCE COUNTY, NEW YORK.
Final rept.,
Richard W. Grover, and John C. Krol. Apr 72, 47p
2

Descriptors: (*Residential buildings, Surveys), (*Regional planning, *New York), Inventories, Problem solving, Houses, Trailers, Rehabilitation, Forecasting, Recommendations.
Identifiers: Vacant houses, *Saint Lawrence County (New York).

The report makes an overview of housing in St. Lawrence County to determine general housing problems in this non-metropolitan region. Census data from 1970 was reviewed in terms of housing types and trends, vacancy rates, and home ownership as well as overcrowding and substandard housing. Along with mobile homes, publicly subsidized housing has contributed to high housing unit vacancy rate. Rehabilitation has been determined as the best means to address the wasted resource of vacant housing. The rapidly increasing number of seasonal housing units is discussed.

PB-217 098/3 PC$3.00/MF$0.95
Illinois Univ., Champaign. Dept. of Psychology.
ILLINOIS STUDIES OF THE ECONOMICALLY DISADVANTAGED. SOME REACTIONS TO EMPLOYING BLACKS.
Technical rept.,
Roy S. Malpass, and John S. Symonds. Jul 71, 34p
TR-10 SRS-12-55175-5J
Grant SRS-15-55175

Descriptors: (*Socioeconomic status, Attitudes), (*Negroes, Employment), Divergence, Caucasians, Employment, Roles (Behavior), Human behavior, Social psychology.
Identifiers: *Disadvantaged groups, Employer employee relations, *Champaign (Illinois).

A University of Illinois study (1969) illustrates that there are differences in perceiving social actions and environment between the disadvantaged black employee and the white employer. Areas of differing priorities, expectations, attitudes, norms, values, and associations are shown to be the separation of work and social role behavior, salaried versus hourly employment, notifying employer in event of illness, punctuality, competence, money, initiative, and conformity with peers. These areas are experienced first hand by the authors of the study and are reported through their black assistants from the disadvantaged sector in the Champaign and Urbana, Illinois, black community.

PB-218 046/1 PC$6.75/MF$0.95
Central New York Regional Planning and Development Board, Syracuse.
GENERAL ANALYSIS OF FOURTH COUNT 1970 CENSUS DATA FOR THE CENTRAL NEW YORK REGION.
Final rept.
Dec 72, 95p CNYRPDB-RS-72-HUD-246-05

Descriptors: (*Demographic surveys, *New York), (*Census, Statistical data), Age, Income, Classifications, Employment, Job analysis, Education, Residential buildings, Municipalities.
Identifiers: Counties, Central New York region.

The report contains fourth count census data and accompanying analysis for the central New York region. The data are arranged in statistical tables for the counties of Cayuga, Cortland, Madison, Onondaga, and Oswego, and the cities of Auburn, Fulton, Cortland, Oneida, Syracuse, and Oswego. Various demographic and housing characteristics are covered by the statistics, including family income, type of income, employment by industry and occupation, school years completed, count of owner and renter occupied housing units, units occupied by elderly persons, persons per room, rent as a percent of income, and age of housing structures.

PB-218 052/9 PC$5.00/MF$0.95
Monroe County Planning Council, Rochester, N.Y.
HUMAN RESOURCES PROJECT: A TECHNICAL ANALYSIS.
Final rept.
Sep 72, 56p* MCPC/NY-72-3

Descriptors: (*Humans, *Resources), (*Social welfare, *Regional planning), Inventories, Objectives, Information systems, Organizations, Utilization, Data acquisition, Evaluation, Recommendations, Problem solving, Classifications.
Identifiers: *Human resource problems inventory.

The report is a technical analysis of the Human Resource Problems Inventory. It attempts to evaluate the level of understanding and information generated by the inventory, to interpret the significance of the interrelationships of eight human resource areas, and to develop a set of recommendations to direct the future of this project.

6. BIOLOGICAL AND MEDICAL SCIENCES

6A. Biochemistry

AD-757 071 PC$3.00/MF$0.95
Oklahoma State Univ Stillwater Dept of Biochemistry
ENZYMATIC REMOVAL OF OIL SLICKS.
Final rept.,
Robert K. Gholson, and Patrick E. Guire. 4 Mar 73, 14p
Contract N00014-71-A-0004-0001

Descriptors: (*Enzymes, Oils), Muramidase, Ribonuclease, Purification, Isocyanic acid, Yeasts, Solubility.
Identifiers: *Enzyme technology, *Oil pollution removal, Lipase, Isocyanates, *Emulsifying agents.

A procedure to chemically modify enzymes in order to cause them to adhere to a hydrocarbon-water interface without appreciable loss of enzymatic activity has been developed. So far this procedure has only been applied to 'model' enzymes (muramidase, ribonuclease and 2 lipases) however, it is hoped that it can also be successfully used with purified microbial hydrocarbon oxidizing enzymes when they become available. Partial purification and characterization of extracellular emulsifying factors, produced by microorganisms during their growth on hydrocarbons was also accomplished. These factors are potentially useful in clean up of oil spills by providing an easily biodegradable non-toxic detergent. (Author)

AD-757 324 PC$3.00/MF$0.95
Armed Forces Radiobiology Research Inst Bethesda Md
NEUROCHEMICAL CHANGES IN SPECIFIC REGIONS OF RAT BRAIN DURING DIFFERENT PHASES OF CONDITIONING,
G. N. Catravas, W. L. McFarland, and H. Teitelbaum. Oct 72, 15p Rept no. AFRRI-SR72-16

Descriptors: (*Conditioned reflex, Biochemistry), (*Brain, Biochemistry), Enzymes, Training, Behavior, Central nervous system, Neurology.
Identifiers: Conditioning (Learning), *Neurochemistry.

The activity changes of RNA polymerase, choline acetyl transferase, acetylcholinesterase and monoamine oxidase in five brain areas were investigated in groups of water deprived rats trained to run for water reward, extinguished after training or retrained after extinction. Marked increases in RNA polymerase and choline acetyl transferase activities were observed in the hippocampus of the experimental animals. A pronounced increase in the activity of RNA polymerase was also found in the posterior hypothalamus of trained rats. No significant changes in the activities of the other enzymes tested were observed as a result of training. (Author)

AD-757 475 PC$3.00/MF$0.95
Michigan State Univ East Lansing Dept of Biophysics
THE ELECTRICAL AND PHOTOELECTRICAL CHARACTERISTICS OF LIPIDS AND ARTIFICIAL BIMOLECULAR LIPID MEMBRANES.
Final rept.,
Barnett Rosenberg. Mar 73, 10p
Contract N00014-68-A-0109-0007

Descriptors: (*Lipids, *Membranes (Biology)), (*Biochemistry, Lipids), Scientific research, Electrical properties, Photoelectric materials, Complex compounds, Electrical conductance.
Identifiers: Charge transfer complexes.

The purpose of this project was to investigate the electrical properties and the photoelectrical properties of lipid material in the solid state, and in the form of a bimolecular lipid membrane. This latter structure is the best model system that has yet been developed for the cell membrane. It was the intention to determine whether the lipid material in the solid state and in the form of the bimolecular lipid membranes exhibited any of the semiconductive properties typical of organic materials in the solid state. Also studied was the relationship of the semiconductive characteristics to the functional role played by a membrane in various types of systems in biology. The report presents a synopsis of the research results.

CONF-721118-1 PC$3.00/MF$0.95
Oak Ridge National Lab., Tenn.
ENZYME ASSAYS IN ISOLATED AMNIOTIC CELLS.
M. L. Moss, and W. W. Harris. 10p
From Symposium On Recent Developments In Research Methods And Instrumentation-Bethesda, Md (30 Nov 1972).

Descriptors: *Cells, *Enzymes.

For abstract, see NSA 27 06, number 14363.

JPRS-58183 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
INACTIVATION OF O-ALKYL-S-HEXYLMETHYLTHIOPHOSPHONATES BY ANIMAL BODY TISSUES,
V. I. Rozengart, R. A. Chingisova, V. G. Shmeleva, and I. G. Shcherbak. 8 Feb 73, 11p
Trans. of Voprosy Meditsinskoi Khimii (USSR) v17 n5 p533-537 1972.

Descriptors: (*Phosphorus organic acid esters, Cholinesterase inhibitors), (*Cholinesterase inhibitors, Detoxification), Tissues (Biology), Thin layer chromatography, Chemical analysis, USSR, Translations.
Identifiers: *Phosphonothioic acid/methyl-O-(ethyl-ester)-S- (hexyl-ester).

The report contains a discussion and data on the detoxification of anticholinesterase compounds evaluated by reduction in a concentration of unaltered inhibitor whose residual quality was determined by thin-layer chromatography. (Author)

JPRS-58318 PC$3.00/MF$0.95
Joint Publications Research Services, Arlington, Va.
THE INFLUENCE OF AN ATMOSPHERE OF MOLECULAR HYDROGEN UPON THE EVOLUTION OF OXYGEN BY LEAVES OF TRADESCANTIA FLUMINENSIS VELL.,
D. A. Zakrzhevskii, L. N. Rozonova, and V. M. Kutyurin. 26 Feb 73, 9p
Trans. of Fiziologiya Rastenii (USSR) v19 n6 p1199-1203 1972.

Descriptors: (*Photosynthesis, *Anaerobic processes), Plant physiology, Helium, Hydrogen, Oxygen, Plants (Botany), Leaves (Botany), USSR, Translations.

The report contains results of an investigation of the effect of atmospheres of H2 and of He on the evolution of O2 by leaves of Tradescantia fluminensis Vell.

N73-16071 PC$10.00/MF$0.95
Fraunhofer-gesellschaft Zur Forderung Der Angewandten Forschung E. V., Grafschaft (West Germany). Inst. Fuer Aerobiologie.
NMR SPECTROSCOPIC AND CALORIMETRIC INVESTIGATION OF RIBONUCLEASE A AND T1 . KMR-SPEKTROSKOPISCHE UND KALORIMETRISCHE UNTERSUCHUNG DER RIBONUKLEASE A UND DER RIBONUKLEASE T1.
H. Rueterjans. 1972, 160p BMVG-FBWT-72-7
Subm- Sponsored in Part By Bundesmin. Fuer Verteidigung, Und Deut. Forschungsgemeinschaft

Descriptors: *Enzymology, *Heat measurement, *Nuclease, *Proton magnetic resonance, Calorimeters, Histidine, Inhibitors, Ions, Ribonucleic acids, Spectroscopic analysis, Substrates.

For abstract, see STAR 11 07.

N73-16073 PC$3.75/MF$0.95
Fraunhofer-gesellschaft Zur Forderung Der Angewandten Forschung E. V., Grafschaft (West Germany). Inst. Fuer Aerobiologie.
CALORIMETRIC INVESTIGATION OF ENZYMES. THERMODYNAMIC PARAMETER DETERMINATION OF THE INTERACTION BETWEEN RIBONUCLEASE T1 INHIBITORS AND SUBSTRATES . KALORIMETRISCHE UNTERSUCHUNGEN AN ENZYMEN. DIE BESTIMMUNG THERMODYNAMISCHER PARAMETER DER WECHSELWIRKUNG VON RIBONUKLEASE T1 MIT INHIBITOREN UND SUBSTRATEN.
W. Maurer, W. Haar, and H. Rueterjans. 1972, 35p FMVG-FBWT-72-12
Subm- Sponsored By Bundesmin. Fuer Verteigigung

Descriptors: *Enthalpy, *Enzymology, *Nuclease, Binding, Heat measurement, Inhibitors, Retarding, Substrates, Thermodynamic properties.

For abstract, see STAR 11 07.

N73-16074 PC$4.50/MF$0.95
Fraunhofer-gesellschaft Zur Forderung Der Angewandten Forschung E. V., Grafschaft (West Germany). Inst. Fuer Aerobiologie.
NUCLEAR RESONANCE INVESTIGATION OF ENZYMES. PMR SPECTRA OF RIBONUCLEASE INHIBITOR COMPLEXES . KERNRESONANZUNTERSUCHUNGEN AN ENZYMEN. PMR-SPEKTREN VON RIBONUKLEASE-INHIBITOR-KOMPLEXEN.
W. Maurer, W. Haar, and H. Rueterjans. 1972, 46p BMVG-FBWT-72-13
Subm- Sponsored By Bundesmin. Fuer Verteidigung

Descriptors: *Catalytic activity, *Enzymology, *Nuclease, *Proton magnetic resonance, *Ribonucleic acids, Histidine, Inhibitors, Nucleotides.

For abstract, see STAR 11 07.

SGAE-2038 PC$3.00/MF$0.95
Oesterreichische Studiengesellschaft Fuer Atomenergie G.m.b.h., Seibersdorf. Institut Fuer Biologie.
PURINE-PHOSPHORIBOSYLPYROPHOSPHATE TRANSFERASE IN HEN ERYTHROCYTES.
G. Partsch, and H. Altmann. Sep 72, 7p
Lang- In German. U. S. Sales only

Descriptors: *Transferases.

For abstract, see NSA 27 06, number 14435.

6B. Bioengineering

JPRS-58283 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
ASPECTS OF ORGANIZING AN AUTOMATED CONTROL SYSTEM IN THE MEDICAL INDUSTRY,
V. I. Kulskov. 21 Feb 73, 8p

Trans. of Khimiko-Farmatseviticheskii Zhurnal (USSR) v6 n12 p56-60 1972.

Descriptors: (*Industries, *Automatic control equipment), (*Medicine, Industries), Control equipment, Computers, Management planning, USSR, Translations.

The report contains a review of the use of an automated control system in the medical industry by employing computers and the use of economic-mathematical methods.

LA-DC-72-1482 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
SOME MEDICAL APPLICATIONS OF ACCELERATORS.
L. Rosen. 1972, 31p CONF-721202-8
Contract W-7405-ENG-36
From Nuclear Science Symposium And Exhibits-

Descriptors: *Accelerators, *Medicine.

For abstract, see NSA 27 06, number 14406.

N73-16039 PC$3.25/MF$0.95
Wisconsin Univ., Madison. Dept. of Electrical Engineering.
NONINVASIVE MEASUREMENT OF CENTRAL VENOUS PRESSURE.
Semiannual Status Report, 1 May - 31 Oct. 1972
J. G. Webster, and S. M. Mastenbrook, Jr. Nov 72, 21p NASA-CR-130348
Contract NGR-50-002-204

Descriptors: *Biophysics, *Blood pressure, *Doppler effect, *Human beings, *Medical equipment, Clinical medicine, Physiological responses, Respiration.

For abstract, see STAR 11 07.

N73-16060 PC$11.25/MF$0.95
West Florida Univ., Pensacola.
THE USE OF REMOTE SENSORS TO RELATE BIOLOGICAL AND PHYSICAL INDICATORS TO ENVIRONMENTAL AND PUBLIC HEALTH PROBLEMS.
Sep 72, 182p NASA-CR-128727
Contract NAS9-11872

Descriptors: *Diseases, *Environmental control, *Health physics, *Remote sensors, Fever, Parasitic diseases, Red tide, Vegetation, Water pollution.

For abstract, see STAR 11 07.

N73-16093 PC$6.25/MF$0.95
Southwest Research Inst., San Antonio, Tex. Biomedical Applications Team.
SOUTHWEST RESEARCH INSTITUTE ASSISTANCE TO NASA IN BIOMEDICAL AREAS OF THE TECHNOLOGY UTILIZATION PROGRAM.
Monthly Report, 1-31 Dec. 1972
31 Dec 72, 84p NASA-CR-130022
Contracts NASW-1867, SWRI PROJ. 13-2538

Descriptors: *Bioengineering, *Devices, *Medical electronics, *Prosthetic devices, Bioinstrumentation, Electronic equipment, Medical equipment, Nasa programs, Technology utilization.

For abstract, see STAR 11 07.

N73-16095 PC$4.50/MF$0.95
Geoscience, Ltd., Solana Beach, Calif.
A URINE VOLUME MEASUREMENT SYSTEM.
Final Report, 29 Apr. 1971 - 31 Dec. 1972
H. F. Poppendiek, G. Mouritzen, and C. M. Sabin. Dec 72, 47p NASA-CR-128726, GLR-113
Contract NAS9-11612

Descriptors: *Flowmeters, *Urination, *Volumetric analysis, Aerospace environments, Bioengineering, Biometrics, Manned space flight.

For abstract, see STAR 11 07.

PAT-APPL-326364 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
AUTOMATIC INOCULATING APPARATUS.
Patent Application
J. R. Wilkins, and S. M. Mills. Filed 24 Jan 73, 19p NASA-CASE-LAR-11074-1
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Culture techniques, *Inoculation, *Mechanical devices, *Microbiology, Automatic control, Laboratory equipment, Patent applications.

An automatic inoculating apparatus for agar trays is reported that uses a simple inoculating element such as a cotton swab or inoculating loop. The apparatus includes a movable carriage for supporting the tray to be inoculated, a drive motor for moving the tray along a trackway and a swabbing motor for automatically swabbing the tray during movement. An actuator motor controls lowering and lifting of the inoculating element. An electrical control system including limit microswitches enables automatic control of the actuator motor and return of the carriage to the initial position after inoculating is completed.

6C. Biology

AD-757 302 PC$3.00/MF$0.95
Defence Research Information Centre Orpington (England)
VOICE AND HEARING IN THE SYSTEM OF ACOUSTIC ORIENTATION OF ANIMALS.
V. D. Ilichev. Feb 73, 23p Rept nos. DRIC-Trans-3056, DRIC-BR-30412
Trans. of Zhurnal Obshchei Biologii (USSR) v32 n3 p299-311 1971, by E. H. Nurch.

Descriptors: (*Acoustics, Animals), (*Sound signals, Animals), Sense organs, Hearing, Voice communication systems, Ecology, USSR.
Identifiers: Translations, *Bioacoustics.

The general rules determining the interrelation of acoustic systems in various systematic groups and at various levels of evolution were examined. The acoustic organs sometimes do not reveal homologous successions, and their evolution, from the structural point of view, bears a mosaic character. At the same time, functional characteristics of hearing and voice and the interrelation between them reveal clear changes in the following directions: (a) in the sphere of sound communication, more and more vital situations are involved, (b) the functional (dynamic) range is widened, (c) the acoustic systems are universalized and their numbers are decreased. The interrelations of the voice and hearing are considered as a biological correlation of a special type, guaranteeing organismic, populational and biocoenotic channels of interrelation. In various systematic groups in relation to the use of sounds in specific ecology, these or other channels acquire a decisive significance. (Author)

AD-757 571 Reprint
Marineland Research Lab St Augustine Fla
DOLPHIN VISION STUDIES: 1. GROSS ANATOMY AND OPTICS OF THE DOLPHIN EYE (TURSIOPS TRUNCATUS). 2. RETINAL ANATOMY OF THE BOTTLENOSED DOLPHIN (TURSIOPS TRUNCATUS). 3. VISUAL ACUITY UNDER CONDITIONS OF NEAR DARKNESS AND DISCRIMINATION LEARNING IN THE ATLANTIC BOTTLENOSED DOLPHIN (TURSOPS TRUNCATUS),
David K. Caldwell, and Melba C. Caldwell. Mar 73, 32p Rept no. TR-11
Contract N00014-70-C-0178
Prepared in cooperation with Florida Univ., Gainsville. Communication Sciences Lab.
Availability: Pub. in Cetology, v10 p1-12, 31 Dec 72, v11 p1-11 Dec 72, v12 p1-7 Dec 72.

Descriptors: (*Cetacea, *Vision), Eye, Anatomy, Optics, Retina, Anatomy, Visual perception, Visual acuity, Learning.
Identifiers: *Dolphins (Mammals), Dark adaptation, *Marine mammals.

The dolphin eye is slightly hyperopic in sea water but accommodation can bring it to emmetropia. In air the eye is highly myopic. The fundus is fully tapetalized and the vascular pattern is holangitic. Pupils are large and highly mobile. Pupil movements are conjunctive and eye movements are disjunctive. The Atlantic bottlenosed dolphin has a duplex retina in which cones are by no means rare. The ganglion cells are similar to the giant ganglion cells found in other mammals. Visual acuity of an Atlantic bottlenosed dolphin was tested in water under conditions of near darkness at viewing distances of 46, 91, and 183 cm. The subject was able to respond to the test design at visual angles that subtended 1 degree, 18 minutes; 1 degree, 20 minutes; and 42 minutes of arc, respectively, suggesting that visual acuity improves with distance under this particular set of conditions. (Author Modified Abstract)

BNL-17345 PC$3.00/MF$0.95
Brookhaven National Lab., Upton, N. Y.
USE OF PROTOPLASTS FOR GENETIC RESEARCH.
P. S. Carlson. 1972, 25p CONF-721061-1
From Symposium On Plant Growth Regulation-Washington, D. C. (16 Oct 1972).

Descriptors: *Plants.

For abstract, see NSA 27 06, number 14349.

BNL-17495 PC$3.00/MF$0.95
Medical Research Council, London (England). Experimental Radiopathology Research Unit.
INTRODUCTION TO THE BIOLOGY OF THE MAMMALIAN CELL.
M. M. Elkind. 1970, 18p CONF-721001-1
From Conference On Physical Mechanisms In Radiation Biology- Airlie, Va (11 Oct 1972).

Descriptors: *Cells.

For abstract, see NSA 27 06, number 14351.

BNWL-1519 PC$3.00/MF$0.95
Battelle Pacific Northwest Labs., Richland, Wash.
EFFECT OF THERMAL SHOCK ON VULNERABILITY TO PREDATION IN JUVENILE SALMONIDS. II. A DOSE RESPONSE BY RAINBOW TROUT TO THREE SHOCK TEMPERATURES.
C. C. Coutant. Nov 72, 14p
Contract AT (45-1)-1830

Descriptors: *Osteichthyes.

For abstract, see NSA 27 06, number 14352.

CEA-CONF-2123 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Grenoble (France). Centre D'Etudes Nucleaires.
EXACT LOCALIZATION OF FLUORINE ON POLLUTED NEEDLES OF ABIES ALBA BY MICROANALYSIS WITH PROTONS.
J. P. Garrec, E. Ligeon, A. Bontemps, R. Bligny, and A. Fourcy. 9p CONF-721010-12
Lang- In French. From International Conference On Modern Trends In Activation Analysis-Saclay, France (2 Oct 1972). U. S. Sales only

Descriptors: *Fluorine, *Gymnospermidae.

For abstract, see NSA 27 06, number 11653.

CEA-R-4325 PC$6.00/MF$0.95
Commissariat A L'Energie Atomique, Fontenay-Aux-Roses (France). Centre D'Etudes Nucleaires.
AN APPROACH TO AUTOMATED CHROMOSOME ANALYSIS.
Roland Le Go. Oct 72, 374p
Lang- In French. Thesis. U. S. Sales only

Descriptors: *Chromosomes.

For abstract, see NSA 27 06, number 14358.

COM-73-10406 Reprint
National Marine Fisheries Service, Beaufort, N.C. Center for Estuarine and Menhaden Research.
SPORT FISH HARVEST FROM ROUGH RIVER, KENTUCKY, BEFORE AND AFTER IMPOUNDMENT,
Willian R. Turner. 1971, 10p NOAA-73022704
Pub. in Reservoir Fisheries and Limnology Special Publication, n8 p321-329 1971.

Descriptors: (*Fishes, Recreation), Fishing, Reservoirs, Streams, Rivers, Recreational facilities, Kentucky.
Identifiers: Sport fishing.

Creel surveys were conducted on Rough River, Kentucky, for 1 year (1959) before impoundment and for the first 4 years (1961-64) after impoundment to measure changes in fishing effort, angling success, creel composition, and total harvest. The total sport-fish harvest from Rough River was estimated at 3,195 fish (410 kilograms) in 1959. The catch surged to 168,622 fish (13,437 kg) during the first survey year (consisting of a 4-month period) on the new reservoir, and during the next 3 survey years (consisting of 7 months each) and average of 216,944 fish (28,518 kg) was harvested. The transition from stream to reservoir was beneficial to some sport fishes and detrimental to others. (Author)

COM-73-10489 PC$3.00/MF$0.95
New Mexico Agricultural Experiment Station, University Park.
LIFE HISTORY, ECOLOGY, AND MANAGEMENT OF THE RIVER CARPSUCKER, 'CARPIODES CARPIO' (RAFINESQUE), WITH REFERENCE TO ELEPHANT BUTTE LAKE.
Research rept. 1 Apr 68-30 Jun 72,
Douglas B. Jester. Dec 72, 125p RR-243
NOAA-73021206

Descriptors: (*Fishes, Animal ecology), Lakes, Rivers, Management, Life cycles, Growth, Natural resources, New Mexico.
Identifiers: Carpiodes Carpio, Carpsucker, Elephant Butte Lake.

The monograph on the life history, ecology and management of the river carpsucker, Carpiodes carpio (Rafinesque) found in Elephant Butte Lake, New Mexico provides 120 references pertinent to this study and a key to the species Carpiodes is included. The study is intended to serve as a basis for comprehension of the management problem. (Author)

COO-1332-76 PC$3.00/MF$0.95
Minnesota Univ., Minneapolis.
POPULATION DYNAMICS OF RED FOXES IN NORTH CENTRAL UNITED STATES.
G. L. Storm. Dec 72, 231p
Contract AT (11-1)-1332
Thesis.

Descriptors: *Foxes.

For abstract, see NSA 27 06, number 14365.

COO-3110-7 PC$3.00/MF$0.95
Institute For Cancer Research, Philadelphia, Pa.
EFFECT OF MUTAGENS ON BUDR RESISTANCE IN HAPLOID CELLS- GENETIC OR EPIGENETIC
Liselotte Mezger-Freed. 1972, 20p CONF-721055-1
From World Symposium On Model Studies In Chemical Carcinogenesis- Baltimore, Md (31 Oct 1972).

Descriptors: *Mutagens.

For abstract, see NSA 27 06, number 14374.

COO-3115-4 PC$3.00/MF$0.95
Columbia Univ., Irvington-On-Hudson, N. Y. Nevis Biological Station.
POLYMORPHISMS FOR T-LETHALS IN EUROPEAN POPULATIONS OF MUS.
L. C. Dunn, and Dorothea Bennett. 1972,
Contract AT (11-1)-3115

Descriptors: *Mice.

For abstract, see NSA 27 06, number 14375.

EDFB-IBP-72-11 PC$3.00/MF$0.95
Oak Ridge National Lab., Tenn.
MODELING THE GROWTH OF TREES. PROCEEDINGS OF WORKSHOP ON TREE GROWTH DYNAMICS AND MODELING, DUKE UNIVERSITY, OCTOBER 11-12, 1971.
C. E. Murphy Jr, J. D. Hesketh, and B. R. Strain.
Dec 72, 205p CONF-711064
Contract W-7405-ENG-26

Descriptors: *Angiospermidae.

For abstract, see NSA 27 06, number 14379.

LA-DC-72-1466 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
PHYSICAL METHODS FOR RAPID ON-LINE DETECTION OF TRICHINELLA IN PORK.
J. D. Seagrave, and D. M. Holm. 17p
CONF-721125-1
From 3. International Conference On Trichinellosis- Miami Beach, Fl. (2 Nov 1972).

Descriptors: *Meats, *Nematoda.

For abstract, see NSA 27 06, number 14405.

N73-16040 PC$6.00/MF$0.95
George Washington Univ., Washington, D.C. Dept. of Medical and Public Affairs.
A BIBLIOGRAPHY OF WILDLIFE MOVEMENTS AND TRACKING SYSTEMS.
M. Werber. Sep 70, 78p NASA-CR-130380
Contract NSR-09-010-027

Descriptors: *Animals, *Bibliographies, *Biology, Biotelemetry, Homing, Orientation, Tracking (position).

For abstract, see STAR 11 07.

N73-16062 PC$3.25/MF$0.95
Kanner (Leo)Associates, Redwood City, Calif.
ANALYSIS OF ELECTROCARDIOGRAMS OF RHESUS MONKEYS (MACACA MULATTA).
Y. Mu-chen, and S. Chia-kiang. Jan 73, 21p
NASA-TT-F-14675
Contract NASW-2481
Tran- Transl. Into English From Sheng Li Hsueh Pao (Peking), V. 27, No. 2, Jun. 1964 P 189-198

Descriptors: *Age factor, *Electrocardiography, *Heart rate, *Monkeys, Bioelectricity, Electrical resistivity, Supine position.

For abstract, see STAR 11 07.

N73-16065 PC$3.25/MF$0.95
Purdue Univ., Lafayette, Ind. Lab. for Applications of Remote Sensing.
SPECTRAL CHARACTERISTICS OF NORMAL AND NUTRIENT-DEFICIENT MAIZE LEAVES.
A. H. Al-abbas, R. Barr, J. D. Hall, F. L. Crane, and M. F. Baumgardner. Aug 72, 22p
NASA-CR-130032, LARS-PRINT-111472
Contracts NGL-15-005-112, DA-12-14-100-10292 (20)

Descriptors: *Absorptance, *Leaves, *Reflectance, Chlorophylls, Infrared radiation, Moisture content.

For abstract, see STAR 11 07.

ORNL-TR-2662 PC$3.00/MF$0.95
DISTRIBUTION AND LOCALIZATION OF INDUCED CHROMOSOME BREAKS IN BELLEVALIA. III. SODIUM NITRITE.
E. Glaess, and H. Marquardt. 11p

Descriptors: *Sodium nitrites.

For abstract, see NSA 27 06, number 14414.

TT-70-53099 PC$3.00/MF$0.95
Bureau of Sport Fisheries and Wildlife, Washington, D.C.
BIRDS OF SOUTH-EASTERN TRANSBAIKAL (PTITSY YUGOVOSTOCHNOGO ZABAIKALYA),
T. N. Gagina. 1972, 57p
Trans. of Vostochno Sibirskii Otdel Geograficheskogo Obshchestvo SSSR. Protivochymnyi Institut Sibirii i Dalnevo Vostoka. Biologicheskii Sbornik, Irkutsk, 1960 p179-213. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Birds, USSR), Identifying, Animal migrations, Classification, Lakes, Mountains, Translations.
Identifiers: Baikal Lake (USSR).

The report includes a list of birds collected and identified from the southeastern area of the Baikal lake in the USSR.

TT-70-56077 PC$3.00/MF$0.95
Smithsonian Institution, Washington, D.C.
LARUS: JOURNAL OF THE ORNITHOLOGICAL INSTITUTE, ZAGREB. VOLUME 12-13 1958-1959,
Renata Rucner. 1972, 219p
Trans. of Larus (Yugoslavia) v12-13 p7-237 1958-1959, by Nada Kronja-Stanic. The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Birds, *Yugoslavia), (*Periodicals, Birds), Animal migrations, Ecology, Biology, Animal nutrition, Feeding habits, Translations.
Identifiers: *Ornithology, *Bird banding, Hirundo daurica, Swallows, Motacilla flava, Bombycilla garrulus, Dendrocopos syriacus, Woodpeckers, Waxwings.

Contents: Bird banding in 1957 and 1958; Observations of the Red-rumped Swallow, Hirundo daurica, in Montenegro; On the occurrence of the species Motacille flava L. in Yugoslavia with special reference to the subspecies Motacilla flava cinereocapilla Savi; Observation of the Waxwing's (Bombycille garrulus) nutrition in captivity; Seasonal specialization in the feeding patterns of the Syrian Woodpecker, Dendrocopos syriacus, in the Krusevac Area (Zupa); Contribution to the study of the birds of the environs of Split; Some observations on the birds in Koviljski rit marsh; List of birds observed on a trip through Yugoslavia; Ornithological observations on a trip

through Yugoslavia; Contribution to the study of the birds of Albania (Shqipenija) and certain adjacent Yugoslav regions.

6E. Clinical Medicine

ACRH-1000-390 PC$3.00/MF$0.95
Argonne Cancer Research Hospital, Chicago, Ill. Chicago Univ., Ill.
PASSIVE ANTIBODY DELAYS DEVELOPMENT OF CELL MEDIATED IMMUNITY IN RATS RECEIVING RENAL ALLOGRAFTS.
J. L. Biesecker, F. W. Fitch, D. A. Rowley, and F. P. Stuart. 1971, 9p CONF-720941-2
From 4. International Transplantation Society Conference- San Francisco, Ca (24 Sep 1972).

Descriptors: *Immunity.

For abstract, see NSA 27 06, number 14332.

ACRH-1000-391 PC$3.00/MF$0.95
Argonne Cancer Research Hospital, Chicago, Ill. Chicago Univ., Ill. Dept. Of Radiology.
BASIC PRINCIPLES OF RADIOGRAPHIC TOMOGRAPHY, AND POTENTIAL APPLICATION TO NUCLEAR MEDICINE.
P. A. Collins, and Alexander Gottschalk. 1972, 11p CONF-720959-2
From Symposium On Radionuclide Tomography- New York, Ny (15 Sep 1972).

Descriptors: *Radiography/ biomedical.

For abstract, see NSA 27 06, number 14333.

ACRH-1000-397 PC$3.00/MF$0.95
Chicago Univ., Ill. Dept. Of Radiology. Argonne Cancer Research Hospital, Chicago, Ill.
COMPARISON OF THE CARCINOEMBRYONIC ANTIGEN (CEA) IMMUNOASSAY AND THE RADIOLOGIC COLON EXAMINATION IN THE DIAGNOSIS OF CARCINOMA OF THE COLON- PRELIMINARY RESULTS.
W. H. Mccartney, and P. B. Hoffer. 1972, 15p

Descriptors: *Intestines.

For abstract, see NSA 27 06, number 14335.

ACRH-1000-403 PC$3.00/MF$0.95
Argonne Cancer Research Hospital, Chicago, Ill. Chicago Univ., Ill.
/SUP 67/GA SCANNING IN THE STAGING OF MALIGNANT LYMPHOMA.
D. A. Turner, A. Gottschalk, P. B. Hoffer, P. V. Harper, and E. Moran. 1972, 22p CONF-721017-4, SM-164/143
From Symposium On Medical Radioisotope Scintigraphy- Monte Carlo (23 Oct 1972).

Descriptors: *Gallium isotopes ga-67, *Radioisotope scanning.

For abstract, see NSA 27 06, number 14336.

AD-757 113 PC$3.00/MF$0.95
Naval Dental Research Inst Great Lakes Ill
SUMMARIES OF RESEARCH, 1972.
Mar 73, 26p Rept no. NDRI-PR-73-02
See also report dated 28 Feb 72, AD-740 319.

Descriptors: (*Dentistry, Medical research), Teeth, Pathology, Diseases, Mouth, Histology, Biochemistry, Biophysics, Microbiology, Streptococcus.

Brief summaries of progress reports in dental research during 1972 are presented.

AD-757 127 Reprint
Armed Forces Inst of Pathology Washington D C
CIRRHOSIS OF THE LIVER ASSOCIATED WITH ALPHA (1)-ANTITRYPSIN DEFICIENCY,
Kamal G. Ishak, Edwin H. Jenis, Mary L. Marshall, Barrett H. Bolton, and G. C. Battistone. 2 Jun 72, 11p
Availability: Pub. in Archives of Pathology, v94 p445-455 Nov 72.

Descriptors: (*Liver, Diseases), (*Trypsin, Liver), (*Pathology, Liver), Glycogen, Deficiency diseases, Copper, Metabolism, Cytochemistry.
Identifiers: *Trypsin inhibitors, *Cirrhosis.

The clinical, laboratory, and light and electron microscopic findings of hepatic biopsy specimens of a 20-year-old white woman homozygous for alpha 1- antitrypsin deficiency are reported. The patient has a multilobular cirrhosis characterized by multiple cytoplasmic acidophilic bodies in hepatocytes at the periphery of pseudolobulas. The bodies are strongly PAS-positive and resist diastase digestion. Ultrastructurally, the inclusions, composed of a central osmophilic core surrounded by an electronlucent halo, are situated within cisternae of endoplasmic reticulum. The liver contains a greater than normal amount of copper, as demonstrated cytochemically and quantitated by analysis of neutron activation. The hepatic manifestations of previously reported cases are reviewed and discussed. (Author)

AD-757 128 Reprint
Armed Forces Inst of Pathology Washington D C
THE IDENTIFICATION OF LEPROSY AMONG EPITHELIOID CELL GRANULOMAS OF THE SKIN,
J. P. Wiersema, and C. H. Binford. 29 Jul 71, 23p
Summaries in Spanish and French.
Availability: Pub. in International Jnl. of Leprosy, v40 n1 p10-32 1972.

Descriptors: (*Mycobacterium leprae, Histology), Pathology, Skin, Diagnosis, Nerves.
Identifiers: *Leprosy.

In an effort to pinpoint the histopathologic characteristics of tuberculoid leprosy and compare it with sarcoidosis and nonleprotic mycobacterial granulomas of the skin, histopathologic lesion profiles from low power photomicrographs were prepared from illustrative cases to depict the pattern of infiltration and the relationship of the infiltrate and bacilli to nerves. Two patterns of distribution of the histopathologic changes in turberculoid leprosy emerged. In one the distribution of the infiltrate followed the large and small dermal nerves which were usually destroyed and bacilli, were usually at sites of destroyed nerves or in remnants of persisting nerves. In the second in which the infiltrate was prominent in the superficial dermis bacilli were usually seen in the subepidermal zone and in nerves that were not yet involved by infiltrate.

AD-757 131 Reprint
Armed Forces Inst of Pathology Washington D C
JURISDICTIONAL PROBLEMS IN THE AUTOPSY OF AIRCRAFT ACCIDENT VICTIMS,
O. C. Lilienstern. 1972, 4p
Availability: Pub. in Aerospace Medicine, v43 n6 p675-678 Jun 72.

Descriptors: (*Aviation accidents, *Aviation medicine), Aviation safety, Law.
Identifiers: *Autopsy, *Accident investigations, *Federal jurisdiction.

The autopsy of aircraft accident victims is an important aspect in the investigation of the accident. Three jurisdictions--the National Transportation Safety Board, the military services and state of local coroners or medical examiners--have authority, under certain circumstances, to obtain autopsies of aviation fatalities. The legal basis for autopsy by each jurisdiction is examined with a focus upon areas in which the authority of one may intersect that of another. These jurisdictional problems are aggravated by the fact that the purposes and objectives of the three jurisdictions in obtaining autopsies often differ. Statutes and regulations broadly divide the responsibilities of the NTSB and the military services and tend to reduce the occasion for conflict between these jurisdictions. Jurisdictional problems between federal and local authorities may best be avoided by effective communication, but if conflicts persist, the supremacy of federal law will allow the federal jurisdictions to obtain autopsies. (Author)

AD-757 132 Reprint
Armed Forces Inst of Pathology Washington D C
PROLIFERATIVE RETINOPATHY IN ANENCEPHALIC BABIES,
David J. Addison, Ramon L. Font, and Willem A. Manschot. 1972, 10p
Availability: Pub. in American Jnl. of Ophthalmology, v74 n5 p967-976 Nov 72.

Descriptors: (*Retina, Pathology), (*Ophthalmology, Anomalies), (*Brain, Anomalies), Eye, Histology, Pathology.
Identifiers: Anencephalia.

A series of 73 eyes from anencephalic babies was examined histopathologically. In addition to the well-documented ocular findings in anencephaly, nine of these eyes (from six infants) showed various degrees of vascular proliferative changes of the retina and vitreous that strikingly resembled those seen in retinopathy of prematurity. The retinal vascular anomalies observed in these nine eyes ranged from focal proliferation of capillaries in the innermost layers of the retina to areas of frank intraretinal neovascularization, leading to various degrees of vitreous vascularization.

AD-757 178 PC$3.00/MF$0.95
Louisiana State Univ New Orleans School of Medicine
INFECTIOUS AND COMMUNICABLE DISEASES AFFECTING POPULATIONS INTRODUCED INTO ENDEMIC AREAS.
Annual progress rept. no. 5, 1 Oct 71-30 Sep 72,
J. Clyde Swartzwelder, Victor M. Villarejos, George A. Thurber, Stanley H. Abadie, and Jorge Arguedas. 30 Oct 72, 90p
Contract DADA17-68-C-8023
See also report dated 27 Oct 71, AD-734 896.

Descriptors: (*Infectious diseases, Epidemiology), (*Military medicine, Tropical regions), Infections, Virus diseases, Parasitic diseases, Amoeba, Venezuelan equine encephalomyelitis virus, Diarrhea, Etiology, Infectious hepatitis virus, Diptera, Disease vectors, Ecology, Costa Rica, South America, Mississippi.
Identifiers: Chagas diseases, *Tropical medicine, *Biological insect control, Progress reports.

The studies have a direct relationship to medical problems of military importance with particular reference to the tropics. The medical problems which are being studied include the etiologies of diarrheal diseases in the tropics, pathogenesis of amebic lesions, etiology of infectious hepatitis, biological control of Chagas' disease vectors, reconnaissance for a possible Venezuelan equine encephalitis enzootic focus in the Mississippi river delta region, and taxonomy, distribution, and ecology of phlebotomine flies in Bolivia and of black flies in Costa Rica. (Author Modified Abstract)

AD-757 180 PC$3.00/MF$0.95
California Univ Berkeley School of Optometry
PHYSIOLOGICAL INDICES FOR SUBJECTIVE REFRACTION.
Technical rept.,
George Hung, and Elwin Marg. 15 Jan 73, 51p
Contract DADA17-72-C-2044

Descriptors: (*Ophthalmology, *Refraction), (*Eye, Medical examination), Visual perception,

Electrocardiography, Galvanic skin response, Respiration, Physiology.
Identifiers: Eyeblink, Computer aided diagnosis, *Optometry.

In a computerized eye examination, there are times when the examiner is not at the patient's side. Hence, it was anticipated that non-verbal indicators (i.e., EKG, blink, GSR) might be used to aid the computer in converging upon the proper lens correction more expediently. During actual clinical examinations EKG, blink, GSR, arm acceleration, and respiration measurements were made on 38 patients to determine if there is any correlation between any of the above and the patient's uncertainty about his/her response as indicated by reaction time and tone of voice. It was found that the EKG (four patients) and respiratory rate (four patients) were usually steady and rather insensitive to uncertainty of response. For three out of ten patients tested in the blink response, a rough correlation was found. The other seven patients produced non-correlating responses. For twelve patients tested, the GSR was found to be an unreliable indicator of uncertainty. Further, eight patients exhibited little or no arm acceleration movements during the attentive portions of the eye examinations. (Author)

AD-757 214 PC$3.00/MF$0.95
Naval Research Lab Washington D C
LINEAR PROGRAMMING FOR TELEGAMMATHERAPY OF BRONCHOGENIC CANCER (LINEINOE PROGRAMMIROVANIE PRI DISTANTSIONNOI GAMMATERAPII BRONKHOGENNOGO RAKA),
N. N. Dyatlova. 22 Feb 73, 10p Rept no. NRL-Trans-1264
Trans. of Meditsinekaya Radiologiya (USSR) v12 n8 p8-12 1967, by Richard S. Relac.

Descriptors: (*Cancer, Radiotherapy), (*Radiotherapy, Permissible dosage), Radiological dosage, Radiation injuries, Lungs, Spinal cord, Heart, Skin, Tissues (Biology), Gamma rays, Computers, Monitors, Radiography, USSR.
Identifiers: Translations.

The levels of permissible doses in the healthy lung, spinal cord, skin and cardiac muscle have been determined by studying the literature sources on radiation injuries of the chest. Using diagrams of body sections at the level of the tumor, the author has placed limits on the presumed 'hot' areas of the dose field. An electronic computer was used to make the optimal selection of numerous possible decisions. The article gives examples of solutions for the GUT-Co-400 gamma-ray source at 'source-to-skin' distances of 35 and 60 cm. (Author)

AD-757 320 PC$3.00/MF$0.95
Naval Graduate Dental School Bethesda Md
MERCURY VAPOR LEVELS IN DENTAL SPACES,
J. T. Stevens, J. M. Box, and G. B. Pelleu, Jr. 1 Aug 72, 11p* Rept no. NGDS-TR-022

Descriptors: (*Dentistry, Mercury), (*Mercury, Toxicity), Vapors.
Identifiers: Dental materials.

Mercury vapor in sufficient concentration can be toxic to humans. Studies showing vapor levels in dental operating rooms are conflicting in their results. The purpose of this investigation was to compare mercury vapor levels in the air of dental operating rooms at three separate naval facilities. Direct mercury vapor meter readings were taken in a newly remodeled 14-unit facility, an 18-unit student clinic, and a small, carpeted three-operatory clinic. Some conditions contributing to high mercury vapor levels were also evaluated. Highest mercury vapor concentrations for a working day were found in the small clinic, in which the mean value of 0.056 mg/cu m exceeded the revised threshold limit value (TLV). Activities such as carpet vacuuming, stamping of feet, and amalgam trituration momentarily increased mercury concentration to peaks up to 0.20 mg/cu m. A direct relationship was noted between the amount of mercury in the air and the amount of mercury in the urine of persons working in the room. (Author)

AD-757 356 PC$3.00/MF$0.95
Technology Inc San Antonio Tex Life Sciences Div
EXPERIMENTAL INVESTIGATION OF FLASHBLINDNESS PARAMETERS.
Final rept. 4 Sep 69-4 Sep 72,
William H. Bowie, and Stanley C. Collyer. Jan 73, 117p DNA-2982F
Contract DASA01-70-C-0007

Descriptors: (*Flashblindness, *Vision), Visual perception, Recovery, Eye, Damage, Organic pigments, Ophthalmology.

An automated flashblindness apparatus was constructed and is described. Various experiments designed to investigate the effect of flashblindness on foveal vision were conducted and are presented. These experiments included: correlation of flashblindness recovery data with fundus reflectometry data; the effect of preadaptation to high ambient light levels of flashblindness recovery time; foveal recovery time; foveal recovery time as a function of location and area of flash source image; intensity x time relationships; foveal dark adaptation; variability of interindividual flashblindness recovery times and the effect of flash source intensity and duration on recovery times, afterimage brightness and ratio of photopigment bleached. (Author)

AD-757 362 PC$3.00/MF$0.95
Qei Inc Burlington Mass
BIOLOGIC DATA ANALYSIS.
Final rept. 1 Sep 71-31 Aug 72,
Ronald J. Bognore. 31 Aug 72, 104p Rept no. 389-a-0872
Contract N00014-69-C-0389

Descriptors: (*Dentistry, Scientific research), (*Data processing systems, Dentistry), Programming (Computers), Phosphorescence, Tissues (Biology), Histology, Pathology, Electron microscopy, Photometers, Microbiology, Calcium, Fluorides.
Identifiers: Computer aided analysis, Enamel (Dental).

The report covers the analysis and programming services supplied by the originator on research activities for the Naval Dental Research Institute. Seven principal research activities which utilized the Digital Equipment Corporation PDP - 12A computer as a fundamental tool and aid to research are included: Analysis of prophorescence spectra of tissues; analysis of histopathologic data from scanning electron microscopy with an electron probe; analysis of microbiologic data of cariogenic agents; analysis of light scattering photometric data; automatic word recognition system; development of an automated dental health interviewer for history recording; control of an automated system for calcium and fluoride determination in enamel biopsies. (Author)

AD-757 370 PC$3.00/MF$0.95
Office of Naval Research London (England)
THE EDINBURGH UNIT FOR THE TREATMENT OF ALCOHOLISM,
Arthur W. Frisch. 28 Dec 72, 14p Rept no. ONRL-R-19-72

Descriptors: (*Alcohols, Addiction), (*Addiction, *Therapy), Reviews, Psychiatry, Great Britain.
Identifiers: *Alcoholism.

The report contains a brief overview of the activities of the Edinburgh Unit for the treatment of alcoholism. Readers should bear in mind that this is one of many similar studies now being supported in the UK. (Author Modified Abstract)

AD-757 429 PC$3.00/MF$0.95
California Univ Los Angeles Dept of Medical Microbiology and Immunology
SYPHILIS VACCINE AND IMMUNE MECHANISMS.
Annual rept. no. 1, 1 Apr 72-31 Mar 73,
James N. Miller. 31 Mar 73, 40p
Contract N00014-69-A-0100-4039

Descriptors: (*Treponema pallidum, *Vaccines), (*Venereal diseases, Immunity), Preparation, Injection (Medicine), Skin, Muscles, Veins, Effectiveness, Rabbits, Experimental data.
Identifiers: *Syphilis.

Freshly isolated Treponema pallidum, Nichols strain, are being gamma-irradiated with a total of 650,000 rads, fortified with glycerol in final concentration of 15%, and preserved in liquid nitrogen as a source of experimental vaccine. Rabbits have been immunized by both the intramuscular and intravenous routes at 3-week intervals with a total of 3 liquid nitrogen-preserved vaccine doses, each containing approximately 4 X 10 to the 9th power treponemes. Intradermal challenge has revealed some degree of acquired resistance. Each of the vaccinated animals developed VDRL antibody; in contrast, only 3 of the 9 immunized by the intravenous route and none of those vaccinated intramuscularly developed TPI antibody. Treponema pallidum, Nichols strain, suspensions have been purified by multiple centrifugation techniques and appeared 'clean' when examined by darkfield microscopy. (Author)

AD-757 712 PC$3.00/MF$0.95
Oregon Univ Dental School Portland Biophysics Lab
APPLICATION OF ELECTRICAL CURRENT IN DENTAL ANESTHESIA.
Annual summary rept.,
Bhim S. Savara, and R. Wayne Fields. 15 Jan 73, 24p*
Contract DADA17-70-C-0075

Descriptors: (*Dentistry, Anesthesia), (*Anesthesia, Electric currents), Analgesics + Antipyretics, Thresholds (Physiology), Nerves, Teeth, Pain.
Identifiers: *Electroanesthesia.

Investigations are in progress directed to assessing the feasibility of using electrical currents to induce local anesthesia or analgesia. An experimental series has been completed in which it is shown that specific inputs to the sensory cortex of the cat, originating from tooth pulp and believed to be involved in pain perception, can be markedly attenuated by the electrical stimulation of gingiva adjacent to the test tooth with trains of bidirectional pulses. The attenuation of these cortical inputs was significant for mean levels of gingival current ranging from 0.3-10.0 ma, encompassing values which in a;; probability include the isolated activation of nonpainful large-diameter afferent fibers in the gingival or periodontal tissues. The efficacy of gingival stimulation was independent of the frequency over the range 30-1000 pps. The results are interpreted to be probable manifestations of interactions between large- and small-diameter peripheral fiber systems in the corticopetal pathways from tooth pulp and/or electrically dependent peripheral nerve block. (Author Modified Abstract)

CEA-CONF-2063 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Saclay (France). Centre D'Etudes Nucleaires.
QUALITY CONTROL OF RADIOPHARMACEUTICAL PRODUCTS USED IN RHEUMATOLOGY.
Y. Cohen. 1971, 6p CONF-710563-2
Lang- In French. From Meeting On Radioisotope Synoviotherapy (synoviorthesis)- Paris, France (26 May 1971). U. S. Sales only

Descriptors: *Erbium isotopes er-169, *Gold isotopes au-198, *Radiotherapy, *Rhenium isotopes re- 86, *Yttrium isotopes y-9 .

For abstract, see NSA 27 06, number 14354.

CEA-CONF-2121 PC$3.00/MF$0.95
Southern Universities Nuclear Inst., Faure (South Africa). Commissariat A L'Energie Atomique, Saclay (France). Centre D'Etudes Nucleaires.
RAPID NEUTRON ACTIVATION OF BROMINE USING 6.1-MINUTE /SUP 82M/BR- APPLICATION TO THE DETERMINATION OF BROMINE IN BLOOD PLASMA.
M. Peisach, B. Maziere, C. Loc'h, D. Comar, and C. Kellershohn. 1971, 10p CONF-721010-18
From International Conference On Modern Trends In Activation Analysis- Saclay, France (2 Oct 1972). U. S. Sales only

Descriptors: *Blood plasma, *Bromine.

For abstract, see NSA 27 06, number 11651.

CONF-720208 PC$6.00/MF$0.95
Oak Ridge National Lab., Tenn.
EMBRYONIC AND FETAL ANTIGENS IN CANCER. VOLUME 2. PROCEEDINGS OF THE SECOND CONFERENCE, FEBRUARY 14-16, 1972, OAK RIDGE NATIONAL LABORATORY.
N. G. Anderson, J. H. Coggin Jr, Elaine Cole, and J. W. Holleman. 1972, 379p

Descriptors: *Antigens.

For abstract, see NSA 27 06, number 14361.

JPRS-58305 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
PROGRESS AND TASKS OF SOVIET CARDIOSURGERY,
B. V. Petrovskii. 23 Feb 73, 10p
Trans. of Kardiologiya (USSR) n12 p5-11 1972.

Descriptors: (*Heart, *Surgery), History, Clinical medicine, USSR, Translations.
Identifiers: *Cardiosurgery.

The report contains a brief history of the origin and development of cardiosurgery in the USSR.

NTIS-PK-30 PC$20.00
National Technical Information Service, Springfield, Va.
SICKLE CELL ANEMIA - SELECTED ABSTRACTS.
Rept. for Jul 64-Jan 73,
William R. Ryerson. Feb 73, 26p*
Supersedes NTIS-PK-3.

Descriptors: (*Sickle cell anemia, Bibliographies), Abstracts, Blood diseases, Anemias, Hemoglobins, Hematology, Genetics, Blood analysis.
Identifiers: *Sickledex test, Prenatal diagnosis, Murayama test, Dithionite test.

The bibliography contains 25 selected abstracts of research reports retrieved utilizing the NTIS online bibliographic search system -- NTISearch. The abstracts include a comprehensive review of the scope and thrust of clinical gains, both diagnostic and therapeutic, made in sickle cell disease.

N73-16037 PC$3.00
National Aeronautics and Space Administration, Washington, D.C.
AEROSPACE MEDICINE AND BIOLOGY A CONTINUING BIBLIOGRAPHY WITH INDEXES, SUPPLEMENT 1086, NOVEMBER 1972.
Nov 72, 101p NASA-SP-7011 (108)

Descriptors: *Aerospace medicine, *Bibliographies, *Biological effects, Abstracts, Aerospace environments, Exobiology, Life support systems, Toxicology.

For abstract, see STAR 11 07.

N73-16063 PC$3.25/MF$0.95
Linguistic Systems, Inc., Cambridge, Mass.
ON TABLE SALT FEVER.
H. Freund. Jan 73, 21p NASA-TT-F-14677
Contract NASW-2482
Tran- Transl. Into English From Arch. Exp. Pathol. Pharm. (Leipzig), V. 65, 1913 P 225-338

Descriptors: *Fever, *Rabbits, *Sodium chlorides, Biological effects, Human pathology, Intravenous procedures, Medical science.

For abstract, see STAR 11 07.

N73-16067 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
A HIGH YIELD NEUTRON TARGET FOR CANCER THERAPY.
D. L. Alger, and R. Steinberg. 1972, 9p
NASA-TM-X-68179, E-7271
Conf- Presented At Conf. on Nucl. Instrumentation for Res. and Develop., Miami Beach, Fla., 6-8 Dec. 1972

Descriptors: *Cancer, *Rotating bodies, *Targets, Helium isotopes, Titanium compounds.

For abstract, see STAR 11 07.

PB-216 075/2 PC$3.00/MF$0.95
George Washington Univ., Washington, D.C. Dept. of Medicine.
STUDY OF REHABILITATION POTENTIAL IN ARTHRITIS THROUGH PROGRAMMED ANALYSIS.
Final rept.,
Thomas McP. Brown, William R. Felts, and Stewart W. Bush. Mar 71, 127p SRS-13-55079-3
Contract SRS-13-55079

Descriptors: (*Arthritis, Diagnosis), Connective tissue, Analysis, Rehabilitation, Predictions, Social psychology, Translations, USSR.

This study to identify patterns of arthritis and connective tissue disorders, the reaction of the patient to his disease, and his rehabilitation potential through programmed analysis, and to validate an earlier study, identified 41 significant variables in the prediction of the degree of a patient's functional capacity, inflammatory process, and mechanical dysfunction. For the validation phase, 73 patients were evaluated using techniques applied in the earlier study. Analysis yielded a set of binary tree diagrams, containing medical and psychosocial variables. The resultant ratings could be used effectively by the clinician to identify specific factors and to make predictive judgements for the use of appropriate rehabilitation resources.

PB-216 158/6 PC$6.75/MF$0.95
Social and Rehabilitation Service, Washington, D.C. Medical Services Administration.
S/UR (SURVEILLANCE AND UTILIZATION REVIEW) OPERATIONAL TECHNIQUES.
Final rept.,
Alton B. Cobb, Normal J. Cole, Robert Wessell, Thomas C. Lindsay, and Thomas E. Singleton. 1 Feb 73, 254p SRS-73-24708
Paper copy also available from NTIS $23.50/set of 3 reports as PB-216 157-SET.

Descriptors: (*Medical services, State government), (*Information systems, *Public health), Methodology, Operations, Projects, Effectiveness.
Identifiers: *Surveillance and utilization review, *Medicaid management information system.

The major purpose is to assist personnel in state Medicaid agencies charged with utilization review responsibilities. It describes the use of a retrospective exception report-based surveillance and utilization review (S/UR) technique. Emphasis is on making effective use of the reports generated by the surveillance and utilization review subsystem of the Medicaid Management Information System (MMIS). This effort is undertaken to safeguard the integrity of state Medicaid programs by determining that patterns of recipient utilization and provider practice are appropriate and to provide a basis for remedial action when they are not. The volume defines specific operational techniques. (Author Modified Abstract)

PB-216 159/4 PC$6.75/MF$0.95
Social and Rehabilitation Service, Washington, D.C.
MARS (MANAGEMENT AND REPORTING SUBSYSTEM) OPERATIONAL TECHNIQUES.
Final rept.,
Solomon J. Axelrod, Alfred G. Fuoroli, C. Wright Hollingsworth, James Morrison, and Lillian Coy. 1 Feb 73, 218p SRS-73-24709
Paper copy also available from NTIS $23.50/set of 3 reports as PB-216 157-SET.

Descriptors: (*Medical services, Information systems), (*Information systems, State government), Public health, Operations, Organizations, Revisions, Reporting.
Identifiers: *Management and reporting subsystem, *Medicaid management information systems.

The 'MARS Operational Techniques' was written to assist state Medicaid personnel to review, analyze and interpret reports generated by the management and administrative reporting subsystem (MARS) of the Medicaid management information systems (MMIS). These reports are designed to help in the difficult task of effectively planning, directing and controlling Medicaid programs by providing information to support the decision-making process. The volume provides instructions in highlighting the MARS reports to determine if any program deficiencies exist and to decide what corrective action steps might be taken to correct the deficiencies. The reports are divided among four functional areas of Medicaid program activity: administration, operations, provider relations, and recipient relations. (Author)

PB-216 160/2 PC$12.50/MF$0.95
Social and Rehabilitation Service, Washington, D.C. Medical Services Administration.
MEDICAID MANAGEMENT INFORMATION SYSTEM (MMIS) LINKAGE BETWEEN THE MMIS GENERAL SYSTEMS DESIGN AND THE OHIO MMIS DETAIL SYSTEMS DESIGN.
Final rept.
Feb 73, 597p SRS-73-24712
Paper copy also available from NTIS $23.50/set of 3 reports as PB-216 157-SET.

Descriptors: (*Medical services, *Ohio), (*Information systems, Medical Services), Management, Operations, Payment, Systems analysis, Organizations, Personnel, Data processing, Requirements.
Identifiers: *Medicaid management information systems, General systems design, Recipients.

The purpose of the MMIS GSD/Ohio DSD Linkage document is to provide a capsule summary of the Ohio Title 19 Program characteristics and an overview description of the Medicaid management information system developed for the state of Ohio. A special attempt has been made to point out differences and exceptions between the Ohio detail systems design and the MMIS general systems design. A cross reference between the MMIS/GSD modules and the Ohio DSD modules is provided for each subsystem. (Author Modified Abstract)

PB-216 429/1 PC$3.00/MF$0.95
Research Foundation for Mental Hygiene, New York.
MULTIPLE FAMILY THERAPY OF MENTAL PATIENTS.
Final rept.
Nov 71, 118p SRS-15-55309-3
Grant SRS-15-55309

Descriptors: (*Rehabilitation, *Mental disorders), (*Group therapy, Family relations), Employment, Psychiatry.
Identifiers: Vocational rehabilitation, Mental patients.

In a 1-year study to compare the value of a new treatment program combining multiple family therapy and vocational counseling of family members (MFT program) with other therapy programs, no differences in effectiveness were found between the MFT program and a therapy program without MFT. No statistically significant results were obtained in an attempt to determine predictive success in the MFT program. Despite the statistical results, the authors felt there were subjective changes in the patients due to the MFT program and, if the treatment period were extended, these changes would become objective. Five papers and nine abstracts on family therapy and its relation to general system theory are included.

PB-216 987/8 PC$3.00/MF$0.95
New York Univ. Medical Center, N.Y.
STUDIES IN COGNITION AND REHABILITATION IN HEMIPLEGIA.
Final rept. 69-71,
Yehuda Ben-Yishay, Joseph Weinberg, and Robert Goodkin. Jul 71, 240p SRS-15-55042-2
Contract SRS-15-55042

Descriptors: (*Rehabilitation, *Hemiplegia), (*Aphasia, *Speech therapy), (*Cognition, Measurement), Specialized training, Vocational guidance, Research, Projects, Brain damage, Employment, Effectiveness, Personnel development, Improvement.
Identifiers: *Vocational rehabilitation, Impairment measurement, Task performance.

Three studies (1969-1971) were undertaken to demonstrate the potential of three new training methods for hemiplegics. The first two found that the tests used to measure impairment, by measuring ability to perform subtasks, could be used directly as training devices to improve overall performance by improving performance in subtasks, such as block design and scanning behavior. The third study found that most patients' spouses could be trained to assist aphasics in speech improvement. A program was designed to train spouses and to train speech therapists to train spouses. The New York University Medical Center recommends that these projects be extended to the treatment of all brain-damaged persons. (Author)

PB-217 003/3 PC$3.00/MF$0.95
Mayo Foundation, Rochester, Minn.
REGIONAL MAXILLOFACIAL PROSTHETIC REHABILITATION CENTER.
Final rept.,
William R. Laney. Sep 71, 82p SRS-13-55194-5
Grant SRS-13-55194

Descriptors: (*Face (Anatomy), Prosthetic devices), (*Head, Prosthetic devices), Defects, Plastic surgery, Rehabilitation, Radiology, Clinical medicine, Social psychology.
Identifiers: Medical centers, Maxillofacial disfigurement.

In a demonstration project (September 1968-September 1971) establishing a clinic to diagnose, assess, treat, and improve the physical, social, and psychological consequences of maxillofacial disfigurement, a team of physicians, dentists, and other professionals at the Mayo Medical Complex successfully rehabilitated 329 patients. The project included development of methods and techniques including cineradiography and improved prosthesis design. It demonstrated that patients with maxillofacial problems can be received and effectively rehabilitated in a treatment center complex providing the necessary facility, professional and technical special services, personnel, and an atmosphere of cooperative participation are present.

PB-217 004/1 PC$3.00/MF$0.95
Alabama Univ., Birmingham, Medical Center.
A COMPREHENSIVE STUDY OF THE REHABILITATION PROCESS IN PATIENTS IN A CHRONIC DIALYSIS PROGRAM.
Final rept., 1 Jul 66-30 Jun 71,
Jean M. Morgan, Patrick H. Linton, Jack D. Hain, Hollis Mentzer, and George W. Odom. Mar 71, 128p SRS-13-55088-4
Grant SRS-13-55088

Descriptors: (*Urologic diseases, *Rehabilitation), Vocational guidance, Artificial kidneys, Counseling, Family relations, Attitudes, Adjustment (Psychology).
Identifiers: *Hemodialysis, Chronic diseases.

A study (July 1966-June 1971) of patients in a chronic dialysis program indicated that social, vocational, and physical rehabilitation are realistic goals. Sixteen chronic dialysis patients and their family relations were studied by the use of Behavior Descriptive Scales, MMPI, and structured interviews. The major finding was that complete vocational rehabilitation is possible when patient selection is good and other terminal illnesses are excluded. The patient's psychological attitude was directly related to his medical status. Careful medical management reduced medical complications and contributed directly to patient attitudes and adjustment.

PB-217 112/2 PC$3.00/MF$0.95
Scripps Clinic and Research Foundation, La Jolla, Calif.
STUDY OF THE ETIOLOGIC EVENTS AND ANTIGEN-ANTIBODY SYSTEMS IN HUMAN GLOMERULONEPHRITIS AND THE COURSE OF NEPHRITIS IN TRANSPLANTED PATIENTS.
Progress rept. no. 4, 1 Nov 71-1 Nov 72,
Frank J. Dixon, and Curtis B. Wilson. 1 Dec 72, 16p
Contract PH-43-68-621

Descriptors: (*Glomerulonephritis, Etiology), (*Antigen antibody reactions, Glomerulonephritis), (*Surgical transplantation, *Kidney), Nephritis, Immunologic diseases, Pathology, Viruses, Infections, Influenza virus.

The report discusses the immunopathology of glomerulonephritis, transplantation, recurrence of glomerulonephritic antigen-antibody reactions, transplant rejection, complement anti-GBM antibodies, immune complex diseases, HLA antigens, influenza A2 virus.

TT-72-56000/01 PC$3.00/MF$0.95
National Library of Medicine, Bethesda, Md.
MEDICAL JOURNAL. VOLUME 94, NUMBER 1, 1972,
T. Beritic. 1972, 77p
Trans. of Lijecnicki Vjesnik (Yugoslavia) v94 n1 p1-52 1972. The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Medicine, *Yugoslavia), (*Periodicals, Medicine), Tetanus, Prophylaxis, Pregnancy, Urinary system, Infections, Aldosterone, Metabolic diseases, Scarlet fever, Duodenum, Injuries, Bacteria, Asthma, Rhinitis, Therapy, Gamma globulin, Blood banks, Contamination, Translations.
Identifiers: Aldosteronism.

Contents:
Prophylaxis of tetanus;
Urinary infection in pregnancy;
Diagnosis of primary aldosteronism;
Scarlet fever in Zagreb over the past 20 years;
Retroperitoneal rupture of the duodenum;
'Dip-slide' system in the qualitative and quantitative assessment of bacteriuria;
Treatment of bronchial asthma and allergic rhinitis with gamma globulin;
A quick and simple way of obtaining an etiological diagnosis of infections of the urinary organs;
The etiology, control and prevention of bacterial contamination of preserved blood.

6F. Environmental Biology

AD-757 717 PC$6.00/MF$0.95
Skidaway Inst of Oceanography Savannah Ga
RESEARCH TO DETERMINE THE ENVIRONMENTAL RESPONSE TO THE DEPOSITION OF SPOIL ON SALT MARSHES USING DIKED AND UNDIKED TECHNIQUES.
Annual progress rept. no. 1, Nov 70-Dec 71,
Herbert L. Windom, and Robert R. Stickney. Apr 72, 408p
Contract DACW21-71-C-0020

Descriptors: (*Swamps, Ecology), Seacoast, Estuaries, Water pollution, Metals, pH, Salinity, Temperature, Iron, Tides, Mercury, Aquatic animals, Georgia, Plankton, Fishes, Disposal.
Identifiers: *Dredging, *Savannah River, *Earth fills, *Spoil, *Solid waste disposal, Dikes, *Salt marshes, Cordgrass, Spartina alterniflora, Periphyton, Sediments, Water pollution effects (Animals), Water quality data, Pelagic zone, Benthos, Dissolved gases, Nutrients, Biochemical oxygen demand.

The report presents the results of the first year studies of a three year research contract to determine the environmental response to the deposition of dredged material on salt marshes using diked and undiked confinement techniques. The report includes studies of water quality changes, studies of salt marsh sediment responses, and biological studies directed toward identifying any changes in the biota in areas of dredging activities. (Author Modified Abstract)

COO-1771-5 PC$3.00/MF$0.95
Michigan Univ., Ann Arbor (Usa). School Of Natural Resources.
NUTRIENT CYCLING AND PRODUCTIVITY OF DYSTROPHIC LAKE-BOG SYSTEMS (PART A). TECHNICAL PROGRESS REPORT.
F. F. Hooper. Dec 72, 72p
Contract AT (11-1)-1771

Descriptors: *Ecosystems.

For abstract, see NSA 27 06, number 14369.

COO-2083-10 PC$3.00/MF$0.95
Michigan Univ., Ann Arbor. Great Lakes Research Div.
ECOLOGICAL CONCEPT OF THE COASTAL ZONE IN THE GREAT LAKES.
C. L. Schelske. 26 May 71, 17p

Descriptors: *Lakes.

For abstract, see NSA 27 06, number 14370.

PB-216 184/2 PC$6.00/MF$0.95
National Environmental Research Center, Cincinnati, Ohio.
CYCLING AND CONTROL OF METALS,
Marion G. Curry, and Gilbert M. Gigliotti. Feb 73, 187p* NERC-C-CP-73-1
Proceedings of an Environmental Resources Conference, Columbus, Ohio. 31 Oct-2 Nov 72. Sponsored in part by Environmental Protection Agency, Washington, D.C., National Science Foundation, Washington, D.C. and Battelle Columbus Labs., Ohio.

Descriptors: (*Trace elements, *Pollution), (*Air pollution, Trace elements), (*Water pollution, Trace elements), Meetings, Geological transportation, Toxicity, Sources, Lead, Zinc, Copper, Mercury, Iron, Arsenic, Asbestos, Beryllium, Industrial wastes, Criteria, Standards, Economic fac-

tors, Monitors, Legislation, Public health, Accumulation, Residues.
Identifiers: Water pollution control, Mine acid drainage, Metal recycling, Solid wastes, Path of pollutants.

The problems of metals and their relationships to the environment are reported. The source of trace metals in the environment, their transport and effects, control processes, monitoring, and economic and legal aspects are among the topics discussed.

6H. Food

BFL-3/1972 PC$3.00/MF$0.95
Bundesforschungsanstalt Fuer Lebensmittelfrischhaltung, Karlsruhe (West Germany). Institut Fuer Strahlentechnologie.
LONG-TERM ANIMAL FEEDING STUDY FOR TESTING THE WHOLESOMENESS OF AN IRRADIATED DIET WITH A HIGH CONTENT OF FREE RADICALS.
D. Reichelt, H. W. Renner, and J. F. Diehl. Apr 72, 132p
Lang- In German. U. S. Sales only

Descriptors: *Milk, *Radiation, *Rats.

For abstract, see NSA 27 06, number 12271.

EURISOTOP-70 PC$3.00/MF$0.95
European Atomic Energy Community, Brussels (Belgium). Bureau Eurisotop.
ECONOMIC AND TECHNOLOGICAL STUDY OF THE IRRADIATION OF SHRIMPS (CRANGON VULGARIS FABR.).
P. Hovart, W. Schietecatte, and W. Vyncke. Sep 72, 172p
U. S. Sales only

Descriptors: *Meats, *Radiation.

For abstract, see NSA 27 06, number 12282.

6L. Medical and Hospital Equipment

AD-757 251 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
AN EXPERIMENTAL INVESTIGATION OF THE TEMPERATURE FIELD PRODUCED BY A SURGICAL CRYOPROBE.
Master's thesis,
William Kirk Petrovic. Dec 72, 64p

Descriptors: (*Surgical instruments, Probes), (*Surgical techniques, Low-temperature research), Test methods, Heat transfer, Heat of fusion, Gelatins, Computer programs, Theses.
Identifiers: *Cryosurgery, Cryobiology, *Surgical cryoprobes, Liquid crystals.

The temperature field produced by a cryosurgical probe embedded in a clear gelatin-water test medium has been experimentally investigated. The temperature field emanating from the cryoprobe was measured using a thin mylar sheet sprayed with liquid crystals, a temperature -117C were studied. The experimental results compared within approximately 9% of a one dimensional analytical solution for predicting ice growth rate. (Author)

PB-215 885/5 PC$3.75/MF$0.95
State Univ. of New York, Brooklyn. Downstate Medical Center.
NEW APPROACHES IN THE SELECTION OF MATERIALS COMPATIBLE WITH BLOOD.
Annual rept. 16 Oct 71-30 Nov 72,
Philip N. Sawyer, and Supramaniam Srinivasan. 15 Jan 73, 36p* PH-43-68-75-5
Contract PH-43-68-75
See also Report dated 21 Dec 70, PB-197 356.

Descriptors: (*Mechanical organs, *Plastics), (*Blood coagulation, Plastics), (*Mechanical hearts, Plastics), Electrochemistry, Fibrinogen, Adsorption, Thrombosis, Heparins, Silicone resins, Epoxy resins, Aluminum, Metals, Polarimetry, Halocarbon plastics, In vivo analysis, In vitro analysis.
Identifiers: *Blood compatible materials, Biomaterials, Cardiac assist devices.

The effect of subjecting fibrinogen to constant potential and constant current electrolysis at platinum-Krebs solution interface on the clottability of the protein was determined. Thrombin time determinations were employed to measure clottability and ultraviolet absorption spectrophotometry was used to estimate the concentration of the protein in solution. Fibrinogen from AB Kabi, Sweden was used for most of the studies. Highly cathodic potential (-800 mv vs Ag/AgCl) and cathodic currents (400 micro A) extends significantly the thrombin times over the controls (approx. +300%) while the effect on fibrinogen level is much less marked (approx. 10%). Highly anodic potentials (+800 mv vs Ag/AgCl electrode) and anodic currents (40 micro A anodic) leads to a reduction in thrombin times of the protein (approx. -30%). Here also the change in fibrinogen concentration is not significant (approx. -5%).

PB-215 886/3 PC$3.00/MF$0.95
Polysciences, Inc., Warrington, Pa.
POLYMER STUDIES RELATED TO PROSTHETIC CARDIAC MATERIALS WHICH ARE NON-CLOTTING AT A BLOOD INTERFACE.
Annual rept. Jan-Aug 72,
B. David Halpern, and Heinz W. Blessing. 2 Feb 73, 19p* PH-43-66-1124-6
Contract PH-43-66-1124
See also report dated 22 Jan 71, PB-200 987.

Descriptors: (*Mechanical heart valves, *Polyacrylamides), (*Mechanical organs, Polyacrylamides), (*Blood coagulation, *Plastics), (*Graft polymerization, Polyacrylamides), Acrylic resins, Plastic coating, Polymers, Gels, Thermoplastic resins, Prosthetic devices.
Identifiers: Biomaterials, *Blood compatible materials, Cardiac assist devices.

Grafting of polyacrylamide hydrogel has been carried out successfully on vena cava test rings (Gott) and renal embolus test rings (Kusserow). Measurements of tensile strength of polyurethane substrate indicate that a polyacrylamide hydrogel graft of less than 5 microns thickness does not alter the mechanical properties. Preliminary grafting studies indicate that MEM-213 (polycarbonate-b-dimethyl siloxane), the material from which hollow fibers of blood oxygenator (Dow) are spun, can be grafted with polyacrylamide. Studies for grafting the inside surface of blood oxygenator (Dow) capillary fiber bundles is in progress.

PB-216 509/0 PC$3.00/MF$0.95
Baylor Coll. of Medicine, Houston, Tex. Dept. of Physical Medicine.
GAIT ANALYSIS - PROSTHETIC FUNCTION IN SERIES OF ABOVE-KNEE AMPUTEES.
Final rept. 1 May 68-30 Apr 71,
Lewis A. Leavitt, and Efrain N. Zuniga. Apr 71, 88p SRS-23-55230-6
Grant SRS-23-55230

Descriptors: (*Leg (Anatomy), *Prosthetic devices), Mobility, Evaluation, Fitting, Rehabilitation, Handicapped workers.
Identifiers: Biomechanics.

A project to quantify prosthetic fit and to define anomalies of gait in above-knee amputees found that automated measurements of tissue-socket interface pressure, knee angle extension and flexion, and time incidence of floor-foot contact, followed by computer analysis of collected data in terms of 35 gait parameters, provide the specific information needed for better prosthetic fit. Characteristics of gait, including duration of walking cycle and components, were determined for 20 nonamputees, 20 'good gait' amputees, and 15 'poor gait' amputees. The sequence of events during stance phase and swing phase reflected what was occurring in an amputee's gait due to varied modular components in the above-knee prosthesis. Such information results in improved patient treatment and more successful vocational rehabilitation.

PB-216 513/2 PC$3.00/MF$0.95
Texas Inst. for Rehabilitation and Research, Houston.
RESEARCH DEVELOPMENTS OF LOWER EXTREMITY ORTHOTIC SYSTEMS FOR PATIENTS WITH VARIOUS FUNCTIONAL DEFICITS.
Final rept.,
Thorkild J. Engen. Sep 71, 116p SRS-23-55233-61
Grant SRS-23-55233

Descriptors: (*Leg (Anatomy), *Prosthetic devices), Musculoskeletal system, Braces, Supports, Design, Evaluation.
Identifiers: *Orthotics, Paraplezia, Biomechanics.

A 3-year research and development project to devise and clinically evaluate new design concepts for lower extremity orthoses developed a technique for corrugating polypropylene and produced a brace that was lighter than conventional devices, whose strength could be adjusted to the individual patient's needs, that was more cosmetic than conventional devices, and could be worn inside standard shoes. The 97 patients used in the study all liked the new device better than their conventional devices, despite the fact that the springs tended to break two or three times per year of use. The customizing process involved in constructing the new device has promising applications for patients whose disability is not stabilized and for patients for whom it is desired to provide the minimum of support.

PB-216 514/0 PC$3.00/MF$0.95
California Univ., Los Angeles. Prosthetics/Orthotics Education Program.
FUNCTIONAL LONG LEG BRACE RESEARCH.
Final rept. 1969-70,
Charles M. Scott. Mar 71, 68p SRS-23-55268-9
Grant SRS-23-55268, SRS-RD-2670

Descriptors: (*Prosthetic devices, Leg (Anatomy)), (*Leg (Anatomy), *Braces), Supports, Evaluation, Design, Musculoskeletal system, Fabrication.
Identifiers: *Orthotics, Bromechanics.

The research (February 1969-January 1970) indicated the practical use of the functional long leg brace with patients requiring external support for a flaccid knee. A biomechanical analysis of the brace demonstrated that the brace is mechanically stable during walking without a knee lock device. The evaluation of the brace also resulted in two design modifications: a mechanical type ankle joint to replace the original hydraulic system and a shoe insert stirrup attachment. The research also indicated potential increase in muscle power as a result of wearing this brace.

PB-216 515/7 PC$3.00/MF$0.95
Texas Inst. for Rehabilitation and Research, Houston.
INSTRUCTION MANUAL FOR FABRICATION AND FITTING OF A BELOW KNEE CORRUGATED POLYPROPYLENE ORTHOSIS.
Final rept.,
Thorkild J. Engen. Sep 71, 60p SRS-23-55233-62
Grant SRS-23-55233

Descriptors: (*Leg (Anatomy), *Prosthetic devices), Musculoskeletal system, Fabrication, Design, Evaluation, Polypropylene.
Identifiers: *Orthotics, Paraplezia, Biomechanics.

A 3-year research and development project at the Department of Orthotics at the Texas Institute for Rehabilitation and Research resulted in this manual for the construction of a light-weight below-knee orthosis, as described in report 23-55233-6a, made of polypropylene and worn inside the shoe. The manual presents the construction process in 55 pictures with accompanying text.

6M. Microbiology

AD-757 073 PC$3.00/MF$0.95
Naval Medical Research Unit No 4 Great Lakes Ill
RESEARCH CLERKSHIP REPORTS, 1972.
Final rept.,
Peter T. Senatore, and Robert Thomas. Dec 72, 30p Rept no. NAMRU-4-72.16

Descriptors: (*Diplococcus pneumoniae, *Glycoside hydrolases), (*Neisseria meningitidis, *Estrogens), Hormones, Growth, Enzymes, Bacteria, Scientific research.
Identifiers: *Neuraminidase.

Contents:
Mouse studies to investigate Diplococcus pneumoniae neuraminidase;
Estrogens and their effects on the growth of Neisseria meningitidis.

AD-757 283 PC$3.00/MF$0.95
Army Medical Research Inst of Infectious Diseases Frederick Md
ENTEROTOXINS OF PATHOGENIC STAPHYLOCCI: A SURVEY,
V. I. Bugrova. 1971, 12p
Trans. of Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii (USSR) v47 p120-126 Nov 70.

Descriptors: (*Staphylococcus, *Toxins + Antitoxins), (*Food poisoning, Staphylococcus), Toxicity, Purification, Bacteria, Microbiology, Biological assay, Laboratory animals, USSR.
Identifiers: Translations, Enterotoxins, *Staphylococcal enterotoxins, Food sanitation.

The study of the various forms of staphyloccic food poisoning is one of the urgent tasks in the microbiology of sanitation and food. It has been established that the causes of food poisoning are the enterotoxins of certain pathogenic staphylocci. During the past decade researchers in a number of countries have sought to obtain an enterotoxin in purified from with the purpose of studying its precise nature. With the use of modern methods (electrophoresis, chromatographic fractionation, ultracentrifuging, spectral analysis in the infrared and ultraviolet, etc.) a number of various types of entrotoxins have been brought to light. They have been designated A, B, C, D, etc. The enterotoxic properties of staphylococci as determined in biological experiments are discussed.

AD-757 371 PC$3.00/MF$0.95
Office of Naval Research London (England)
MICROBIOLOGY IN BELGIUM,
Arthur W. Frisch. 2 Jan 73, 24p Rept no. ONRL-R-1-73

Descriptors: (*Microbiology, Belgium), Scientific research, Biochemistry, Viruses.

Microbiological research is expanding rapidly in Belgium with the aid of excellent equipment and the participation of well trained young scientists. Particularly impressive are some of the programs in virology, biochemistry and microbiology where good basic work is being carried on. Some of the current results are reported herein. (Author)

CONF-720623-3 PC$3.00/MF$0.95
Oak Ridge National Lab., Tenn.
COMPATABILITY OF MICROBIAL MEASUREMENTS.
Martin Witkamp. 1972, 22p
From Symposium On Modern Methods In The Study Of Microbial Ecology- Uppsala, Sweden (19 Jun 1972).

Descriptors: *Minerals.

For abstract, see NSA 27 06, number 14362.

N73-16059 PC$3.50/MF$0.95
Hardin-simmons Univ., Abilene, Tex. Dept. of Biology.
A STUDY OF PSYCHROPHILIC ORGANISMS ISOLATED FROM THE MANUFACTURE AND ASSEMBLY AREAS OF SPACECRAFT TO BE USED IN THE VIKING MISSION.
Preliminary Report of Planetary Quarantine Activities, 1 Oct. - 31 Dec. 1972
T. L. Foster, and L. Winans, Jr. Jan 73, 30p
NASA-CR-130009
Contract NGR-44-095-001
Conf- Presented At the Semiann. Nasa Spacecraft Sterilization Technol. Seminar, New Orleans, 30-31 Jan. 1973

Descriptors: *Bioassay, *Microorganisms, *Planetary quarantine, *Soils, *Viking mars program, Microbiology, Production engineering, Quality control, Spacecraft sterilization.

For abstract, see STAR 11 07.

PAT-APPL-326198 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
APPARATUS FOR MICROBIOLOGICAL SAMPLING.
Patent Application
J. R. Wilkins, and S. M. Mills. Filed 24 Jan 73, 14p
NASA-CASE-LAR-11069-1
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Microbiology, *Microorganisms, *Sampling, *Surface properties, Automatic control, Bioinstrumentation, Laboratory equipment, Mechanical devices, Patent applications.

An automatic apparatus for microbiologically sampling surfaces using a cotton swab is reported which eliminates human error normally associated with this process. The apparatus includes a self powered transport device, such as a motor driven wheeled cart, which mounts a swabbing motor drive for a crank arm which supports a swab in the free end thereof. The swabbing motor is pivotally mounted and an actuator rod movable responsive to the cart traveling a predetermined distance provides lifting of the swab from the surface being sampled and reversal of the direction of travel of the cart.

PB-216 602/3 PC$3.00/MF$0.95
Missouri Water Resources Research Center, Rolla.
PHYSIOLOGY AND NATURAL DISTRIBUTION OF THE BACTERIUM CARYOPHANON LATUM IN THE FRESH WATERS OF MISSOURI.
Completion rept.,
James B. Hufham, Ralph Carroll, and Joyce Hill. 18 Nov 72, 20p W73-06032, OWRR-A-048-MO (1)
Contract DI-14-31-0001-3525

Descriptors: (*Water pollution, *Indicator species), (*Ruminants, Water pollution), Caryophanaceae, Ecology, Physiology, Culture media, Streptomycins, Reproduction (Biology), Nutrients, Agricultural wastes, Water analysis, Fluid filters, Membranes, Agar, Missouri.
Identifiers: *Water pollution detection, Nutrient requirements, *Caryophanon latum.

One of the major technical problems in maintaining present water quality is in the field determination of non-human fecal pollution, especially that resulting from bovine and other ruminant farm stock. The presence of a bio-indicator microorganism unique to the feces of these animals, but ubiquitous in terms of its presence there would aid in making pollution determinations. An organism selected was for this purpose was Caryophanon latum. Its selection was based on its presence in and restriction to ruminant fecal material. The report describes a study of the physiology of Caryophanon latum and the development of a selective medium for growing the organism to the exclusion of most, if not all, other organisms found in stream water. After development of this selective medium, the procedure was evaluated on sample stream waters with and without inoculation with the organism.

6O. Pharmacology

AD-757 076 PC$3.00/MF$0.95
Oklahoma State Univ Stillwater Dept of Biochemistry
STUDIES ON ADDICTION AND WITHDRAWAL IN CELL CULTURES.
Progress rept. 1 Mar 72-28 Feb 73,
Franklin R. Leach, and M. Louise Higgins. 28 Feb 73, 29p
Contract N00014-71-A-0004-0001

Descriptors: (*Drugs, Addiction), (*Psychotropic agents, Pharmacology), Biochemistry, Analgesics + Antipyretics, Narcotics, Tissue culture cells, Nerve cells, Cells (Biology), Biochemistry, Physiology, In vitro analysis, Hypnotics + Sedatives, Antihistaminics, CNS stimulants.
Identifiers: *Psychoneuropharmacology.

The objectives were to determine if cell cultures of neuronal and/or nonneural cells can be used to study the biochemical changes that occur during long term exposure of cells to drugs which become addictive and from which withdrawal reactions occur. The drugs chosen for study have differing pharmacological and addictive effects. The compounds are: analgesics, narcotic; analgesics, nonnarcotic; hypnotic and sedatives; aliphatic alcohol; CNS active agents; antihistamine. Experimental results are discussed.

AD-757 159 PC$3.00/MF$0.95
Edgewood Arsenal Md
EFFECTS OF DRUGS ON HUMAN OPERANT PERFORMANCE.
Technical rept. May-Jul 71,
Stanley H. Holgate. Feb 73, 15p Rept no. EA-TR-4718

Descriptors: (*Drugs, *Motor reactions), Performance (Human), Psychotropic agents, Dosage, Barbiturates.
Identifiers: *Psychoneuropharmacology, Methylphenidate, Diazepam.

The present experiment is one in a series directed toward the development of an operant task which is sensitive to the effects of low doses of various drugs and agents. Four human subjects were given limited training on an operant task that required both attention and moderately fast response rates. Intravenous injections of 1 ml saline, 5 mg diazepam, 250 mg sodium amobarbital, and 10 mg methylphenidate were given in successive sessions in random order. Numbers of responses and errors were subjected to variance analyses. Overall, saline had no significant effect on either response or error rates. Compared to saline, diazepam produced a slight increase in error rates, but it did not alter response rates: amobarbital depressed response rates and increased error rates; whereas methylphenidate increased both response rates and error rates. (Author)

AD-757 161 PC$3.00/MF$0.95
Edgewood Arsenal Md
EFFECTS OF ETHANOL ON OPERANT PERFORMANCE IN HUMANS.
Technical rept. Nov-Dec 71,

Stanley H. Holgate. Feb 73, 20p Rept no. EA-TR-4722

Descriptors: (*Ethanols, *Motor reactions), Alcohols, Performance (Human), Perception, Psychotropic agents, Attention.
Identifiers: *Psychoneuropharmacology, Avoidance responses, Reflexes.

Two volunteers served in two experiments using operant techniques to study the effects of alcohol on human avoidance responding. In the first experiment, the task required response rates ranging from 0.6 to 5.6 responses per second. Increasing amounts of ethanol (0.5 to 1.5 ml/kg) and increasing response rate requirements interacted additively in producing performance decrements as measured by error percentages. The results suggested that motor coorination was impaired more than attention or observing behavior. Differential-reinforcement-of-low-rate schedules, in combination with limited-hold intervals for reinforcement, were used in the second experiment. In one subject, increasing amounts of alcohol (.05 to 1.5 ml/kg) resulted in increasing over-estimations of time lapse and a large increase in the number of errors at the highest dose. The other subject demonstrated variability in response and error rates as a function of dose and response contingencies. For the latter subject, a possible functional relationship among response characteristics, amounts of alcohol, and a personality variable was suggested. In both subjects, alcohol interfered with normal temporal perception. (Author)

AD-757 368 PC$3.00/MF$0.95
Office of Naval Research London (England)
INTERNATIONAL CONFERENCE ON PROSTAGLANDINS, VIENNA, AUSTRIA, 25-28 SEPTEMBER 1972.
Conference rept.,
Arthur W. Frisch. 28 Dec 72, 19p Rept no. ONRL-C-20-72

Descriptors: (*Vasoactive agents, Symposia), Hormones, Physiology, Biochemistry, Medicine, Pharmacology, Austria.
Identifiers: *Prostaglandins, Contraceptives, Birth control.

The Conference demonstrated a broad interest by scientists in a new group of hormone-like substances which are just being recognized as mediators of many physiological and pathological responses. They are complex; they seem to be formed at the cell membrane level, and as small molecules, they stimulate the release of other small molecules. The prostaglandins are not essential for survival of cells, but practically all of the organs in the body are affected by their presence. Although the emphasis, at present, is on the control of pregnancy, the prostaglandins will soon be receiving serious attention in physiological situations involving neuromuscular responses, particularly of the emergency type; in stress situations involving brain, lung and central nervous system; and in cascading reactions such as occur in clotting, the release of the catechol amines, and complement activation. They will also turn out to be of importance in the initial phases of acute reactions to injury such as burns, shock states, the crush syndrome, and anaphylaxis. The exact role of prostaglandins in maintaining cell nutrition and in regulating hormone release is still to be elucidated. (Author Modified Abstract)

AD-757 592 Not available NTIS
Defence Research Establishment Suffield Ralston (Alberta)
ATROPINE-INSENSITIVE VASODILATATION AND HYPOTENSION IN THE ORGANOPHOSPHATE-POISONED RABBIT,
E. Preston, and C. Heath. 30 Mar 72, 14p
Prepared in cooperation with Alberta Univ., Edmonton. Dept. of Pharmacology.
Availability: Pub. in Archives Internationales de Pharmacodynamie et de Therapie, v200 n2 p231-244 Dec 72.

Descriptors: (*Cholinesterase inhibitors, Organic Phosphorus compounds), (*Organic phosphorus compounds, Toxicity), (*Atropine, Cholinesterase inhibitors), (*Hypotension, Organic phosphorus compounds), Soman, Pharmacology, Blood pressure, Vasoactive agents, Cardiovascular system.

The organophosphate anticholinesterases sarin, soman or DFP rapidly induce profound hypotension in anesthetized rabbits despite artificial ventilation and atropine treatment to prevent bradycardia. Hypotension results from an atropine-insensitive vasodilatation, demonstrated in the autoperfused forelimb. Soman induces depression of basal vasomotor tone; however, this is antagonized by atropine while systemic hypotension remains profound. It is suggested that hypotension stems from organophosphate effects within the neuronal vasomotor pathway. (Author)

LA-TR-72-31 PC$3.00/MF$0.95
CYTOSTATIC ACTION OF DAUNOMYCIN IN THE PULSE CYTOPHOTOMETRY TEST.
W. Goehde, and W. Dittrich. 8p

Descriptors: *Growth-inhibitor drugs.

For abstract, see NSA 27 06, number 14407.

N73-16072 PC$4.50/MF$0.95
Fraunhofer-gesellschaft Zur Forderung Der Angewandten Forschung E. V., Grafschaft (West Germany). Inst. Fuer Aerobiologie.
ANTIDOTES FOR ALKYL PHOSPHATE POISONING STRUCTURE-EFFECT RELATIONS IN VIVO AND IN VITRO . ANTIDOTE GEGEN ALKYLPHOSPHATVERGIFTUNGEN STRUKTUR-WIRKUNGS-BEZIEHUNGEN IN VIVO AND IN VITRO.
H. Oldiges, and K. Schoene. 1972, 47p
BMVG-FBWT-72-8
Subm- Sponsored By Bundesmin. Fuer Verteidigung

Descriptors: *Alkyl compounds, *Antidotes, *Pyridines, *Toxic diseases, Chemical reactions, Phosphates, Toxicology.

For abstract, see STAR 11 07.

N73-16075 PC$4.25/MF$0.95
Fraunhofer-gesellschaft Zur Forderung Der Angewandten Forschung E. V., Grafschaft (West Germany). Inst. Fuer Aerobiologie.
PHARMACOLOGICAL INVESTIGATION OF THE PARASYMPATHOLYTICAL EFFECT OF MONO AND BISQUATERNARY PYRIDINIUM COMPOUNDS ON THE ISOLATED GUINEA PIG ILEUM . PHARMAKOLOGISCHE UNTERSUCHUNGEN UEBER DEN MECHANISMUS DER PARASYMPATHOLYTISCHEN WIRKUNG MONO- UND BISQUARTAERER PYRIDINIUM-VERBIDUNGEN AUF DAS ISOLIERTE ILEUM DES MEERSCHWEINCHENS.
D. Kuhnen-clausen. 1972, 43p
BMVG-FBWT-72-14
Subm- Sponsored By Bundesmin. Fuer Verteidigung

Descriptors: *Guinea pigs, *Intestines, *Pharmacology, *Pyridines, Muscle relaxants, Sympathetic nervous system.

For abstract, see STAR 11 07.

N73-16076 PC$4.75/MF$0.95
Fraunhofer-gesellschaft Zur Forderung Der Angewandten Forschung E. V., Grafschaft (West Germany). Inst. Fuer Aerobiologie.
SKIN PROTECTION AGAINST HIGH TOXIC PHOSPHORIC ACID ESTERS . UNTERSUCHUNGEN ZU EINEM HAUTSCHUTZ GEGENUEBER HOCHTOXISCHEN PHOSPHORSAEURE-ESTERN PHOSPHORSAEURE-ESTERN.
G. Schreiber. 1972, 55p BMVG-FBWT-72-15
Subm- Sponsored By Bundesmin. Fuer Verteidigung

Descriptors: *Phosphates, *Protective coatings, *Skin (anatomy), *Toxic hazards, Alkyl compounds, Cholinesterase, Esters, Penetration, Phosphoric acid.

For abstract, see STAR 11 07.

UCSF-10-P-2-182 PC$3.00/MF$0.95
California Univ., Los Angeles. Lab. Of Nuclear Medicine And Radiation Biology.
SURVIVAL OF CLONOGENIC CELLS FROM A MURINE SOLID TUMOR TREATED IN VIVO WITH RADIATION AND CHEMOTHERAPEUTIC AGENTS.
M. D. Wharam, T. L. Phillips, Lawrence Kane, and J. F. Utley. 1972, 20p

Descriptors: *Bleomycin, *Cells/ cultured, *Cyclophosphamide, *Dactinomycin, *Gamma radiation, *Radioprotective compounds, *Urea/ /-bis -CHLOROETHYL- -nitroso-.

For abstract, see NSA 27 06, number 12278.

6P. Physiology

ACRH-1000-393 PC$3.00/MF$0.95
Argonne Cancer Research Hospital, Chicago, Ill. Chicago Univ., Ill. Dept. Of Biochemistry.
ERYTHROPOIETIN AND THE INDUCTION OF ERYTHROID CYTODIFFERENTIATION.
E. Goldwasser. 1972, 12p CONF-720633-2
From 4. International Congress Of Endocrinology-Washington, D. C. (19 Jun 1972).

Descriptors: *Erythrocytes, *Erythropoietin.

For abstract, see NSA 27 06, number 14334.

AD-757 102 Reprint
Army Medical Research Inst of Infectious Diseases Frederick Md
THE EFFECT OF LEUKOCYTIC ENDOGENOUS MEDIATOR (LEM) ON SERUM COPPER AND CERULOPLASMIN CONCENTRATIONS IN THE RAT (36926),
Robert S. Pekarek, Michael C. Powanda, and Robert W. Wannemacher, Jr. 28 Jul 72, 3p
Availability: Pub. in Proceedings of the Society for Experimental Biology and Medicine, v141 n3 p1029-1031 Dec 72.

Descriptors: (*Leukocytes, *Copper), (*Globulins, Leukocytes), (*Infections, Leukocytes), Blood serum, Metabolism.
Identifiers: *Ceruloplasmin, *Leukocytic endogenous mediator.

Leukocytic endogenous mediator (LEM) was shown to produce significant increases in serum Cu and ceruloplasmin concentrations in the rat within 12 hr after its administration. This increase coincided with an increase in the incorporation of 3H-leucine into total serum proteins which also was shown to be induced by LEM. (Author)

AD-757 156 PC$3.00/MF$0.95
Edgewood Arsenal Md
KINETIC EVIDENCE FOR A UNIQUE HIGH AFFINITY UPTAKE SYSTEM FOR CHOLINE IN RAT BRAIN SYNAPTOSOMES.
Technical rept. Aug 71-Jul 72,
Henry I. Yamamura, Tommy L. Gardner, Louis A. Fedele, and Solomon H. Snyder. Jan 73, 15p Rept no. EA-TR-4701

Descriptors: (*Cholines, *Brain), Absorption (Biological), Acetylcholine, Nerve cells, Dynamics.

Synaptosomes from rat brain accumulate choline by two kinetically distinct processes, a high-affini-

ty uptake system (Km = .000001 M) and a low-affinitysystem (Km = .00009 M). The high-affinity uptake has an absolute requirement for sodium and is associated with considerable formation of acetylcholine. By contrast the low-affinity uptake system has much less dependence on sodium and does not appear to be associated with a marked degree of acetylcholine formation. The high-affinity choline uptake appears to represent choline accumulation selectively by cholinergic neurons. (Author)

AD-757 304 Reprint
Brooke Army Medical Center Fort Sam Houston Tex Army Inst of Surgical Research
THE EFFECT OF POTASSIUM AND EXTRACELLULAR VOLUME ON RENAL BICARBONATE REABSORPTION,
Neil A. Kurtzman, Martin G. White, and Philip W. Rogers. 11 Aug 72, 12p
Availability: Pub. in Metabolism, v22 n3 p481-492 Mar 73.

Descriptors: (*Bicarbonates, Absorption (Biological)), (*Potassium, Bicarbonates), Kidneys, Electrolytes (Physiology), Physiology, Cells (Biology).

Bicarbonate reabsorption was measured in dogs infused with either KCl or KHCO3. As has been previously reported, potassium loading depressed bicarbonate reabsorption. Similar studies in dogs with partial obstruction of the thoracic inferior vena cava failed to demonstrate an effect of potassium loading on bicarbonate reabsorption. Extracellular volume was expanded with isotonic saline in three groups of dogs: one with potassium depletion, a second with hyperkalemia, and a third normal group. Bicarbonate reabsorption varied inversely with fractional chloride excretion in all three groups. At any one level of fractional chloride excretion, however, bicarbonate reabsorption was higher in the potassium depleted animals than in the normal dogs, and higher in the normal dogs than in those subjected to potassium loading. This study demonstrates a significant regulatory role of potassium over renal bicarbonate reabsorption. This role can only clearly be defined, however, when the precise state of effective extracellular volume is delineated. (Author)

AD-757 422 PC$3.00/MF$0.95
San Francisco Univ Calif Inst of Chemical Biology
RESEARCH ON CELL BIOLOGY OF CRYOINJURY: THE POSSIBLE ROLE OF LYSOSOMES IN CELLULAR INJURY AFTER FREEZING AND THAWING.
Final progress rept. 1 Feb-1 May 71,
Maxim D. Persidsky. 28 May 71, 24p
Contract N00014-68-C-0367

Descriptors: (*Cells (Biology), Freezing), Wounds + Injuries, Starches, Cytology, Physiology, Hydrolases.
Identifiers: *Cryobiology, *Lysosomes, Croprotective agents.

It is known that freezing and thawing can 'activate' lysosomes by disrupting their membranes and releasing hydrolytic enzymes. As a result lysosomes may become harmful sites of catabolic reactions, thus adding more stress to an already damaged cell. Although it has been suspected that lysosomes might be implicated in cryoinjury, a systematic study on the possible effects of lysosomal enzymes on the fate of the cell following freezing and thawing is not available. This study was undertaken to assess to what degree, if any, activation of lysosomal enzymes correlates with the degree of cellular injury in response to certain variables of cryopreservation, and to investigate if agents that are known to stabilize lysosomal membranes could improve cell recovery.

AD-757 570 Reprint
Rutgers - the State Univ New Brunswick N J
QUANTITATION OF THE BIOENERGETICS OF A TUBERCULOSIS INFECTION IN CHICKS,
R. L. Squibb, M. Solotorovsky, and W. R. Beisel. 22 Jun 72, 6p
Contract DA-49-193-MD-2694
Availability: Pub. in Applied Microbiology, v24 n6 p924-928 Dec 72.

Descriptors: (*Metabolism, *Infections), (*Mycobacterium tuberculosis, Metabolism), (*Nutrition, Mycobacterium tuberculosis), Calorimetry, Ribonucleic acids, Fatty acids, Cholesterol, Glucose, Liver, Chickens, Experimental data.
Identifiers: Glycerides.

Interaction of an avian tuberculosis infection with a known metabolizable energy yield of dietary corn oil in chicks was used to quantitate total host energy expenditure necessitated by the infectious process. Three trials in which two doses of inoculum were used resulted in mild and severe involvements. Trial 1 (mild) indicated that 6% and trials 2 and 3 (severe) that 96 and 93% of the energy supplied by known quantities of corn oil were utilized by the tuberculosis process. In the birds given the low level of inoculum, the degree of tuberculosis involvement, as measured by increased liver size, was correlated with increased total quantities of hepatic ribonucleic acid, monoglycerides, free fatty acids, free cholesterol, and glucose. All of these effects were observed prior to manifestations of clinical symptoms or failure of the chicks to consume all food offered. (Author)

AD-757 600 PC$3.00/MF$0.95
Army Aeromedical Research Lab Fort Rucker Ala
DETERMINING THE SURFACE AREAS OF MINIATURE SWINE AND DOMESTIC SWINE BY GEOMETRIC DESIGN--A COMPARATIVE STUDY,
Thomas L. Wachtel, G. R. McCahan, Jr., William I. Watson, and Michael Gorman. Oct 72, 28p Rept no. USAARL-73-5

Descriptors: (*Swine, Surface area), Geometric forms, Mathematical analysis, Body, Metabolism, Thermal conductivity, Body weight, Physiology.

The geometric design method provides an accurate means of deriving the total body surface area (TBSA) of miniature swine and also the percentage of the TBSA for a given area. The formulae for TBSA derived for domestic swine and the 'Rules of 5' are not applicable to miniature swine. The equation S = 0.121 W. (575) provides a more accurate, quick assessment of TBSA of miniature swine. (Author)

COO-2118-38 PC$3.00/MF$0.95
Illinois Univ., Urbana. Dept. Of Computer Science.
STUDY OF VISUAL SHAPE PERCEPTION.
Kiyoshi Maruyama. Oct 72, 115p UIUCDCS-R-72-533
Contract AT (11-1)-2118
Thesis.

Descriptors: *Vision.

For abstract, see NSA 27 06, number 14372.

JPRS-58173 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
RHYTHM OF SLEEP AND WAKEFULNESS IN CREWS OF THE SPACESHIPS SOYUZ 3-9 BEFORE, DURING AND AFTER EXPOSURE TO SPACEFLIGHT,
A. N. Litsov. 7 Feb 73, 17p
Trans. of Akademiya Nauk SSSR. Izvestiya. Seriya Biologicheskaya, n6 p836-845 1972.

Descriptors: (*Sleep, *Space flight), Rhythm (Biology), Stress (Physiology), Circadian rhythms, Translations, USSR.
Identifiers: *Work rest cycles.

The report contains data on the work and rest regimes of crew members of the Soyuz 3-9 spaceships in the course of preparations for and implementation of space flight.

JPRS-58332 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
ELECTROPHYSIOLOGICAL CORRELATES OF MENTAL ACTIVITY,
V. D. Nebylitsyn, and V. D. Morgovoi. 27 Feb 73, 13p
Trans. of Zhurnal Vysshei Nervnoi Deyatelnosti (USSR) v22 n5 p899-906 1972.

Descriptors: (*Electroencephalography, *Psychology), Central nervous system, Personality, Brain, Physiology, Physiological psychology, Translations, USSR.
Identifiers: Neurophysiology.

The report analyzes the relationship between electroencephalographic data and personality-psychological traits in humans.

6Q. Protective Equipment

AD-757 306 Not available NTIS
Australian Defence Scientific Service Melbourne
A COMPARATIVE ASSESSMENT OF EYE PROTECTIVE DEVICES AND A PROPOSED SYSTEM OF ACCEPTANCE TESTING AND GRADING,
E. C. Wigglesworth. 10 Jun 71, 18p
Availability: Pub. in American Jnl. of Optometry and Archives of American Academy of Optometry, v49 n4 p287-304 Apr 72.

Descriptors: (*Protective coverings, *Eye), Industrial medicine, Shock resistance, Optical properties, Tensile properties, Acceptability, Efficiency.
Identifiers: *Protective eye shields.

The paper presents the results of ballistic and, where appropriate, drop-ball tests on the following plano eye protective devices: (i) goggles fitted with polycarbonate, cellulose acetate, gauze and polymethyl methacrylate lenses; (ii) faceshields with cellulose acetate visors; and (iii) several clip-on configurations. The results are discussed separately and are also presented graphically to permit comparison with earlier similar data for allyl resin and thermally toughened glass. These results suggest the need for a gradation of eye protective devices based on impact resistance. Suitable tests, using a 25 mm diameter steel ball and a 3 mm steel ball are suggested. The impact strength and scratch susceptibility of currently available materials are compared. No completely suitable material is currently available, and there is need for a new protective material that has good optical properties, high impact resistance, good scratch resistance, good cosmetic appearance and long life, and that, in addition, is cheap, light-weight, and readily worked. (Author)

PB-216 399/6 PC$3.00/MF$0.95
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC ADVERTISING SUBSTANTIATION PROGRAM--COUGH DROPS. DOCUMENTATION OF WARNER-LAMBERT COMPANY.
Mar 72, 115p FTC-722-3089-WL

Descriptors: (*Common cold, *Drugs), (*Manufacturers, *Publicity), Cough, Pharynx, Retarding, Documentation.
Identifiers: *Truth in advertising, *Cough drops, Warner-Lambert cold medicine, Listerine antiseptic throat lozenges.

The report consists of documentation submitted in support of claims that the vapor action of Hall's Mentho-Lyptus immediately and effectively cools a raw throat to help your cough and penetrates

deep to make nasal passages feel clearer; that Listerine Antiseptic Throat Lozenges (1) contain medicine which enables them to provide prompt effective relief from sore throats, and (2) can relieve a sore throat so effectively that only minutes after taking them one who has a sore throat is no longer bothered by it; that Listerine Antiseptic Throat Lozenges for Children contain medicine which enables them to provide effective relief from sore throats, and are special for children; and that Listerine Cough Control Lozenges (1) have 50% more cough suppressant than the leading lozenge and (2) provide effective relief from coughing; and that one Listerine Cough Control Lozenge has as much cough suppressant as a teaspoon of the leading cough syrup.

6R. Radiobiology

ACRH-1000-388 PC$3.00/MF$0.95
Argonne Cancer Research Hospital, Chicago, Ill. Chicago Univ., Ill. Dept. Of Radiology.
ADVANCE IN FUNDAMENTAL ASPECTS OF IMAGING SYSTEMS AND TECHNIQUES.
R. N. Beck, L. T. Zimmer, D. B. Charleston, P. V. Harper, and P. B. Hoffer. 1972, 56p
CONF-721017-3
From Smposium On Medical Radioisotope Scintigraphy- Monte Carlo (23 Oct 1972).

Descriptors: *Gamma cameras, *Positron cameras, *Radioisotope scanners.

For abstract, see NSA 27 06, number 11996.

AD-757 038 PC$3.00/MF$0.95
Armed Forces Radiobiology Research Inst Bethesda Md
THE RELATIVE EFFECTIVENESS OF FISSION NEUTRONS FOR GASTROINTESTINAL DAMAGE IN MICE: LETHALITY AND JEJUNAL CRYPT RESPONSE.
Scientific rept.,
G. H. Zeman, S. R. Jones, R. E. George, and S. G. Levin. Sep 72, 20p Rept no. AFRRI-SR72-15

Descriptors: (*Fission neutrons, *Gastrointestinal system), (*Radiation effects, Fission neutrons), Radiological dosage, Radiation injuries, Gamma rays, Mice, Experimental data.

Mice were unilaterally irradiated in either a high neutron or a high gamma ray field. Median doses for gastrointestinal lethality (LD50/6) were 350 rads and 882 rads for the neutron and gamma ray fields, respectively, following single pulsed exposures. Thus, the relative effectiveness of the neutron field at the LD50/6 dose level was 2.5. The percentage of jejunal crypts destroyed at various neutron and gamma ray doses was also determined. The relative effectiveness of the neutron field associated with jejunal crypt destruction ranged from 3.1 at 10 percent crypt destruction to 2.1 at 90 percent. A direct relation between destruction of jejunal crypts and animal lethality was demonstrated. (Author)

AD-757 039 PC$3.00/MF$0.95
Armed Forces Radiobiology Research Inst Bethesda Md
THE DEPENDENCE OF MINIATURE PIG PERFORMANCE DECREMENT UPON GAMMA RAY DOSE RATE.
Scientific rept.,
R. E. George, R. L. Chaput, and E. L. Barron. Dec 72, 21p Rept no. AFRRI-SR72-20

Descriptors: (*Radiological dosage, *Performance (Human)), (*Radiation effects, Performance (Human)), Gamma rays, Partial body irradiation, Dose rate, Swine, Experimental data.

Trained miniature pigs were irradiated in a nuclear reactor-produced gamma ray field. Dose rates at the midline of the brain were 470, 1000, 1500, 2000, or approximately 10,000,000 (pulsed irradiation) rads/minute. Doses ranged from 1500 to 14,700 rads. Postirradiation performance data were used to calculate for each dose rate the most probable dose that would cause 50 percent of the animals to perform unsatisfactorily (ED50). The miniature pigs' response varied markedly with dose rate at less than 2000 rads/minute; ED50's were 10,570, 7780, 2500, and 2380 rads, respectively, for 470, 1000, 1500, 2000, and 10 to the 7th power rads;minute. Survival times, however, did not appear to be dependent upon dose rate. (Author)

AD-757 191 PC$3.00/MF$0.95
School of Aerospace Medicine Brooks AFB Tex
MODIFICATIONS OF FRICKE DOSIMETER FOR MEASURING HIGH RADIATION DOSES.
Final rept. 1 Jun 71-15 May 72,
Kenneth A. Hardy, and James K. Witschy. Dec 72, 23p Rept no. SAM-TR-72-22

Descriptors: (*Radiological dosage, *Dosimeters), Iron, Copper, Electrons.
Identifiers: *Fricke dosimeter system, *Radiation measuring instruments.

The effects of adding excess cupric sulfate to the standard Fricke dosimeter system were observed in measuring large radiation doses. Various concentrations of ferrous ammonium sulfate in this system were investigated for deviations from linear response. The effects of various concentrations of cupric sulfate were also observed. A solution containing 0.003 M ferrous ammonium sulfate, 0.01 M cupric sulfate, and 0.01 N sulfuric acid gave a linear response to doses in excess of 2.0 Mrad and was chosen for further study. The G (Fe (3+))Cu (2+) values for this solution were determined both for 60Co gamma radiation and for 6 Mev electrons produced by a clinical linear accelerator, and were found in both cases to be 0.66 ions/100 ev absorbed. Self-oxidation of the final dosimeter solution and the stability of induced signals were also observed. (Author)

AD-757 325 PC$3.00/MF$0.95
Armed Forces Radiobiology Research Inst Bethesda Md
THE EFFECT OF SUPRALETHAL DOSES OF IONIZING RADIATION UPON MITOCHONDRIA OF THE RAT CENTRAL NERVOUS SYSTEM.
S. L. Cohan, G. N. Catravas, J. R. Abbott, and E. E. Ricks. Jul 72, 16p Rept no. AFRRI-SR72-12

Descriptors: (*Radiation effects, Mitochondria), (*Mitochondria, Central nervous system), (*Central nervous system, Radiation effects), Permissible dosage, Radiological dosage, Respiratory system, Radiation tolerance, Partial body irradiation, Rats, Experimental data.
Identifiers: *Ionizing radiation.

The effect of supralethal doses of ionizing radiation upon the function of rat central nervous system (CNS) mitochondria was studied. Following 20,000 rads to the head there was a significant transient decrease in respiratory control, with a return to control levels by 4 hours after irradiation. Despite this apparent return to normal respiratory function the animals continued to deteriorate clinically, dying of the radiation CNS syndrome within 48 hours. In animals receiving 10,000 rads to the head, there were no apparent abnormalities in the respiratory function of the mitochondria. The results suggest that mitochondira of the CNS are quite radio-resistant when compared to those of other tissues, and this may in part explain the greater radioresistance of the CNS when compared to other organs. (Author)

AD-757 547 PC$3.00/MF$0.95
Texas Univ Austin Electronics Research Center
DYNAMIC SPATIO-TEMPORAL TEMPERATURE MEASUREMENTS IN LASER IRRADIATED RABBIT EYES.
Technical rept.,
Clarence Patrick Cain, and Ashley J. Welch. 11 Sep 72, 120p Rept no. TR-138 AFOSR-TR-72-2015 Contract F44620-71-C-0091

Descriptors: (*Lasers, Eye), (*Sensors, Temperature), (*Eye, Radiation injuries), Retina, Probes, Mathematical models, Thermocouples.
Identifiers: *Laser radiobiology.

Temperature sensors rugged enough to be inserted into the eye were fabricated and used to measure rise caused by a laser irradiation of the eye. Measurements from 12 eyes included temperature-time histories in the ocular fundus and spatial distributions of the temperature increases. A comparison was made between measured temperatures and temperatures predicted by a retinal temperature model. (Author Modified Abstract)

AD-757 660 PC$3.00/MF$0.95
Armed Forces Radiobiology Research Inst Bethesda Md
THE EFFECT OF IONIZING RADIATION UPON MITOCHONDRIA OF THE CENTRAL NERVOUS SYSTEM.
Scientific rept.,
S. L. Cohan, J. R. Abbott, and G. N. Catravas. Oct 72, 18p Rept no. AFRRI-SR72-17

Descriptors: (*Radiation effects, Mitochondria), (*Mitochondria, Central nervous system), Brain, Respiration, Tissues (Biology), Radiological dosage, Peroxides, Radiation tolerance.

The respiratory rate in the presence of substrate + ADP (state 3) and after the conversion ADP yields ATP (state 4) was studied in the mitochondria of the rat brain after irradiation of the rats' heads with an electron linear accelerator. After 20,000 rads irradiation there was a transient diminution of respiratory control (state 3/state 4) when glutamate was used as the substrate, but no abnormalities were seen when succinate was the substrate. Irradiation with 10,000 rads had no effect upon the respiratory rate or respiratory control. The addition of DPNH to irradiated mitochondria had no effect upon mitochondrial respiration as compared to controls. Irradiation of the brain with 20,000 rads failed to produce significantly greater peroxidation than in sham irradiated mitochondria and failed to produce greater swelling in irradiated mitochondria, even in the presence of FeNH4SO4 or ascorbate. The slight and transient changes in respiratory control produced by irradiation in brain mitochondria are in marked contrast to the susceptibility of mitochondria from other organs. The comparative radioresistance of brain mitochondria may be the result of greatly diminished radiation-induced perioxidation of mitochondrial membranes. (Author Modified Abstract)

AD-757 661 PC$3.00/MF$0.95
Armed Forces Radiobiology Research Inst Bethesda Md
THE RELATIONSHIP OF BLOOD-BRAIN BARRIER DAMAGE TO SURVIVAL TIME AFTER ACUTE RADIATION INJURY.
Scientific rept.,
D. E. Wyant, J. Kabal, S. J. Baum, and L. J. Parkhurst. Nov 72, 13p Rept no. AFRRI-SR72-18

Descriptors: (*Cerebrovascular system, *Radiation injuries), Blood circulation, Radiological dosage, Capillaries, Brain, Inhibition, Survival, Rats, Experimental data.

The purpose of this study was to investigate whether a relationship exists between alterations of the blood-brain barrier (BBB) and the survival time of rats exposed to supralethal irradiation. BBB alterations were produced by injection of glycerol, mercuric chloride, or by lymphatic cervical blockade. Animals were subsequently exposed to a supralethal dose of radiation, and the survival times of various groups were compared. The production of BBB alterations prior to irradiation

did not influence the survival time of rats after exposure to supralethal doses of radiation suggesting that BBB damage may bear no direct relationship to the survival time after radiation injury. (Author)

BNFL-REPORT-1 PC$3.00/MF$0.95
British Nuclear Fuels Ltd., Risley (England).
RAPID DETERMINATION OF PLUTONIUM IN URINE- SEPARATION FROM BAKED URINE RESIDUES USING ION-EXCHANGE.
T. H. Bates, T. H. Boyd, and J. P. Clarke. 1971, 21p
U. S. Sales only

Descriptors: *Plutonium, *Urine.

For abstract, see NSA 27 06, number 11703.

BNL-17253 PC$3.00/MF$0.95
Brookhaven National Lab., Upton, N. Y.
RADIOSENSITIVITY OF LYMPHOCYTES.
E. P. Cronkite. 1972, 19p CONF-720956-1
From Conference On Radiosensitivity- Freiburg, Germany (25 Sep 1972).

Descriptors: *Immune reactions, *Lymphocytes, *Tissues, *X radiation.

For abstract, see NSA 27 06, number 12306.

BNL-17282 PC$3.00/MF$0.95
Brookhaven National Lab., Upton, N. Y.
KINETIC OF GRANULOPOIESIS.
E. P. Cronkite. 1972, 29p CONF-720956-2
From Conference On Radiosensitivity- Freiburg, Germany (25 Sep 1972).

Descriptors: *Leukocytes.

For abstract, see NSA 27 06, number 14346.

BNL-17292 PC$3.00/MF$0.95
Medical Research Council, London (England). Experimental Radiopathology Research Unit.
CELLULAR RADIOBIOLOGY AND PARTICLE RADIOTHERAPY- PRINCIPLES, PRESUMPTIONS, AND PITFALLS.
M. M. Elkind. 1972, 11p CONF-721045-2
From Conference On Particle Accelerators In Radiation Therapy- Los Alamos, Nm (2 Oct 1972).

Descriptors: *Cells/ cultured, *Charged particles, *Electrons, *Gamma radiation, *Radiotherapy, *X radiation.

For abstract, see NSA 27 06, number 12276.

BNWL-SA-4459 PC$3.00/MF$0.95
Battelle Pacific Northwest Labs., Richland, Wash.
PROBLEMS FOR RADIATION PROTECTION SPECIALISTS IN SAFETY EVALUATIONS.
C. M. Unruh. Oct 72, 55p CONF-721122-1
From Regional Study Group Meeting On Radiological And Environmental Protection- Istanbul, Turkey (20 Nov 1972).

Descriptors: *Health physics, *Personnel, *Radiation protection.

For abstract, see NSA 27 06, number 14324.

BNWL-1650 (PT.1) PC$6.00/MF$0.95
Battelle Pacific Northwest Labs., Richland, Wash.
PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1971 TO THE USAEC DIVISION OF BIOLOGY AND MEDICINE. VOLUME I. LIFE SCIENCES. PART 1. BIOLOGICAL SCIENCES.
R. C. Thompson. Sep 72, 329p
Contract AT (45-1)-1830

Descriptors: *Radiobiology.

For abstract, see NSA 27 06, number 12325.

CEA-CONF-2067 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Fontenay-Aux-Roses (France). Centre D'Etudes Nucleaires.
APPLICATION OF SOLID TRACK DETECTORS TO DOSIMETRY- PERSONNEL AND SPATIAL DOSIMETRY.
Henry Francois. 1972, 8p CONF-720724-1
Lang- In French. From 8. International Conference On Nuclear Photography And Solid State Track Detectors- Bucharest, Romania (10 Jul 1972). U. S. Sales only

Descriptors: *Alpha particles, *Neutrons, *Radiation detectors/ dielectric track, *Radon.

For abstract, see NSA 27 06, number 12104.

CEA-CONF-2125 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Fontenay-Aux-Roses (France). Centre D'Etudes Nucleaires.
CONTAMINATION BY OSTEOTROPIC BETA EMITTERS. AN EVALUATION OF THE DOSES IN BONE MARROW AND ENDOSTEUM- EFFECT OF AGE.
J. Le Grand. 1972, 19p CONF-720818-4
From 2. International Conference On Strontium Metabolism- Glasgow And Strontian, Scotland (16 Aug 1972). U. S. Sales only

Descriptors: *Beta particles, *Bone marrow, *Bones, *Man.

For abstract, see NSA 27 06, number 12354.

CEA-CONF-2126 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Fontenay-Aux-Roses (France). Centre D'Etudes Nucleaires.
DEPOSITION OF /SUP 90/SR AND CONTAMINATION OF MILK. PROPOSITION OF A MODEL OF TRANSFER.
R. Coulon. 1972, 12p CONF-720818-2
From 2. International Conference On Strontium Metabolism- Glasgow And Strontian, Scotland (16 Aug 1972). U. S. Sales only

Descriptors: *Atmosphere, *Biological models, *Food chains, *Milk, *Strontium isotopes sr-9 .

For abstract, see NSA 27 06, number 11983.

CONF-710501-56 PC$3.00/MF$0.95
Oak Ridge National Lab., Tenn.
RADIATION EFFECTS AND RADIONUCLIDE EXCRETION IN A NATURAL POPULATION OF PINE VOLES.
P. B. Dunaway, J. D. Story, and J. T. Kitchings. 1972, 31p
Contract W-7405-ENG-26
From 2. National Symposium On Radioecology- Oak Ridge, Tenn. (10 May 1972).

Descriptors: *Gamma radiation, *Voles.

For abstract, see NSA 27 06, number 12329.

CONF-721051-2 PC$3.00/MF$0.95
Oak Ridge National Lab., Tenn.
EFFECTS ON AQUATIC BIOTA OF RADIOACTIVE EFFLUENTS FROM NUCLEAR POWER STATIONS.
B. G. Blaylock. 1971, 13p
Contract W-7405-ENG-26
From Panel On Radiation Effects On Population Dynamics In Ecosystems- Reykjavik, Iceland (2 Oct 1972).

Descriptors: *Insecta, *Invertebrates, *Nuclear power plants, *Osteichthyes, *Plants, *Radiation, *Radioactive waste.

For abstract, see NSA 27 06, number 12330.

CONF-721102-3 PC$3.00/MF$0.95
Tennessee Univ., Oak Ridge (Usa). School Of Biomedical Sciences. Oak Ridge National Lab., Tenn.
REPAIR OF RADIATION AND CHEMICAL DAMAGE TO DNA IN HUMAN CELLS.
S. N. Buhl. 1972, 30p
From 12. International Symposium On Basic Biology- Cali, Colombia (27 Nov 1972).

Descriptors: *Cells, *Nucleic acid/ deoxyribo-, *Radiation.

For abstract, see NSA 27 06, number 12272.

CONF-721204-2 PC$3.00/MF$0.95
Oak Ridge National Lab., Tenn.
ESTIMATES OF DOSE FROM /SUP 133/XE TO INFANTS AND CHILDREN FOR IMMERSION IN AN INFINITE CLOUD AND FOR MEDICAL USES.
M. J. Hilyer, and W. S. Snyder. 1972, 16p
Contract W-7405-ENG-26
From 7. Midyear Topical Symposium On Health Physics In The Healing Arts- San Juan, Pr (11 Dec 1972).

Descriptors: *Beta particles, *Man.

For abstract, see NSA 27 06, number 12308.

COO-119-247 PC$3.00/MF$0.95
Utah Univ., Salt Lake City. Radiobiology Div.
/SUP 83/RB AND /SUP 137/CS METABOLISM IN PERSONS AFFECTED BY MUSCLE DISEASE.
R. D. Lloyd, C. W. Mays, S. S. Mcfarland, W. S. Zundel, and F. H. Tyler. Oct 72, 72p
Contract AT (11-1)-119

Descriptors: *Cesium isotopes cs-137, *Diseases, *Rubidium isotopes rb-8 .

For abstract, see NSA 27 06, number 12381.

COO-1671-40 PC$3.00/MF$0.95
Hammersmith Hospital, London England).
RESPONSE OF DETECTORS TO A MIXED RADIATION ENVIRONMENT.
R. Katz, and S. C. Sharma. 14p CONF-720561-1
From 1. Symposium On Neutron Dosimetry In Biology And Medicine- Neuherberg/munich, Germany (15 May 1972).

Descriptors: *Radiation detectors, *Radiation dosimeters.

For abstract, see NSA 27 06, number 12001.

COO-2085-3 PC$3.00/MF$0.95
Michigan Technological Univ., Houghton.
EFFECTS OF GAMMA RADIATION ON LICHENS AND LICHEN-FORMING FUNGI AND ALGAE. PROGRESS REPORT, DECEMBER 1, 1971-DECEMBER 15, 1972.
F. H. Erbisch. 1972, 12p
Contract AT (11-1)-2085

Descriptors: *Algae, *Fungi, *Gamma radiation, *Lichens.

For abstract, see NSA 27 06, number 12292.

COO-2085-4 PC$3.00/MF$0.95
Michigan Technological Univ., Houghton.
LICHENS OF THE ENTERPRISE RADIATION FOREST.
F. H. Erbisch. 1972, 21p
Contract AT (11-1)-2085

Descriptors: *Gamma radiation, *Lichens.

For abstract, see NSA 27 06, number 12293.

COO-2085-5 PC$3.00/MF$0.95
Michigan Technological Univ., Houghton.
EFFECTS OF GAMMA RADIATION ON LICHEN ACIDS.
C. Sartorelli. 1972, 41p
Contract AT (11-1)-2085

Thesis.

Descriptors: *Gamma radiation, *Lichens.

For abstract, see NSA 27 06, number 12294.

COO-2217-2 PC$3.00/MF$0.95
Illinois Inst. Of Tech., Chicago.
INVESTIGATION OF MOLECULAR MECHANISMS IN PHOTODYNAMIC ACTION AND RADIOBIOLOGY WITH NANOSECOND FLASH PHOTOLYSIS AND PULSE RADIOLYSIS. PROGRESS REPORT, APRIL 1, 1972--MARCH 31, 1973.
L. I. Grossweiner. 1972, 13p
Contract AT (11-1)-2217

Descriptors: *Electrons, *Enzymes, *Thymine.

For abstract, see NSA 27 06, number 11780.

COO-3243-1 PC$6.00/MF$0.95
Columbia Univ., New York. Radiological Research Lab.
ANNUAL REPORT ON RESEARCH PROJECT.
1 Jul 72, 303p
Contract AT (11-1)-3243

Descriptors: *Radiation dosimetry, *Radiobiology.

For abstract, see NSA 27 06, number 12303.

COO-414-18 PC$3.00/MF$0.95
Ohio Agricultural Research And Development Center, Wooster.
DETAILED CHARACTERIZATION OF SOIL AND VEGETATION ON SELECTED SITES TO SERVE AS BASIS FOR FUTURE EVALUATION OF EFFECT OF RADIOACTIVE CONTAMINATION. FINAL TECHNICAL REPORT, MARCH 1971-AUGUST 1972.
F. Haghiri. 1972, 69p
Contract AT (11-1)-414

Descriptors: *Emulsions, *Plants, *Resins, *Rosin, *Soils, *Strontium isotopes sr-9 .

For abstract, see NSA 27 06, number 11976.

DUN-SA-130 PC$3.00/MF$0.95
Douglas United Nuclear, Inc., Richland, Wash.
NEW RATE AND INTEGRATING PERSONAL ALARM DOSIMETER DESIGNS.
G. L. Erickson. 25 May 70, 15p CONF-700609-3
From 15. Annual Meeting Of The Health Physics Society- Chicago, Il (28 Jun 1970).

Descriptors: *Radiation detectors/ geiger-mueller.

For abstract, see NSA 27 06, number 12105.

EUR-4885 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Fontenay-Aux-Roses (France). Centre D'Etudes Nucleaires.
LEVELS OF RADIOACTIVE CONTAMINATION OF THE ENVIRONMENT AND THE FOOD CHAIN. ANNUAL REPORT, 1971.
1972, 58p
Lang- In French. U. S. Sales only

Descriptors: *Cesium isotopes cs-134, *Cesium isotopes cs-137, *Chromium isotopes cr-51, *Cobalt isotopes co-58, *Cobalt isotopes co-60, *Environment, *Food chains, *Iodine isotopes i-131, *Krypton isotopes kr-85, *Man, *Radioisotopes, *Strontium isotopes sr-85, *Zinc isotopes zn-65.

For abstract, see NSA 27 06, number 11984.

EURISOTOP-44 PC$3.00/MF$0.95
European Atomic Energy Community, Brussels (Belgium). Bureau Eurisotop.
TECHNOLOGY OF RADIOINDUCED INHIBITION OF SPROUTING OF POTATOES.
F. Sandret. 1971, 70p
Lang- In French. U. S. Sales only

Descriptors: *Gamma radiation, *Vegetables, *X radiation.

For abstract, see NSA 27 06, number 12265.

IEA-258 PC$3.00/MF$0.95
Instituto De Energia Atomica, Sao Paulo (Brazil).
THERMAL NEUTRON DOSIMETRY BY PHOSPHOR ACTIVATION.
M. R. Mayhugh, S. Watanabe, and R. Muccillo.
Dec 71, 7p
U. S. Sales only

Descriptors: *Neutrons/ thermal, *Radiation detectors/ activation, *Radiation dosimeters/ thermoluminescent.

For abstract, see NSA 27 06, number 12106.

JPRS-58136 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
EVOLUTION OF CHANGES IN THE LOOSE CONNECTIVE TISSUE UNDER THE INFLUENCE OF AN OPTICAL QUANTUM GENERATOR,
A. A. Vishnevskii, Jr., and N. V. Tsvganova. 2 Feb 73, 8p
Trans. of Eksperimentalnaya Khirurgiya i Anesteziologiya (USSR) n5 p13-17 1972.

Descriptors: (*Connective tissue, *Lasers), (*Skin, Lasers), Tissues (Biology), Radiation effects, Morphology (Biology), Radiation dosage, Dose rate, Translations, USSR.
Identifiers: *Laser radiobiology.

The report contains a description of the evolution of morphologic changes in the loose connective tissue caused by the irradiation of the skin with an optical quantum generator.

JPRS-58203 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
CHANGES IN PERMEABILITY OF HISTO-HEMATIC BARRIERS UNDER THE EFFECT OF MICROWAVES,
L. V. Polyashchuk. 12 Feb 73, 9p
Trans. of Akademiya Nauk URSR, Kiev. Doklady, n8 p754-758 1972.

Descriptors: (*Tissues (Biology), Radiotherapy), (*Microwaves, Permeability), Brain, Hematopoietic system, Nervous system, Rabbits, Experimental data, USSR, Translations.
Identifiers: *Microwave radiobiology.

The report contains a discussion of the effect of microwaves with various powers and duration on different reflexogenic zones and on permeability of the hemato-encephalic and histo-hematic barriers as observed in rabbits.

KFK-1666 PC$3.00/MF$0.95
Kernforschungszentrum, Karlsruhe (West Germany).
PERSONNEL MONITORING WITH A LIF ALBEDO DOSIMETER IN THE RADIATION FIELD OF A /SUP 252/CF SOURCE.
E. Piesch, B. Burgkhardt, and J. Vaane. Aug 72, 40p EUR-4846
Lang- In German. U. S. Sales only

Descriptors: *Neutrons, *Radiation dosimeters/ thermoluminescent.

For abstract, see NSA 27 06, number 12107.

KURRI-TR-86 PC$3.00/MF$0.95
Kyoto Univ. (Japan). Research Reactor Inst.
LOG NO. 6 OF RADIATION MONITORING WITHIN THE LABORATORY BUILDINGS (1969).
Yukinori Katsurayama. 1971, 21p
Lang- In Japanese. U. S. Sales only

Descriptors: *Beta particles, *Gamma radiation, *Laboratories, *Reactors/ research.

For abstract, see NSA 27 06, number 11967.

KURRI-TR-88 PC$3.00/MF$0.95
Kyoto Univ. (Japan). Research Reactor Inst.
LOG NO. 7 OF RADIATION MONITORING WITHIN THE LABORATORY BUILDINGS (1970).
Yukinori Katsurayama. 1971, 30p
Lang- In Japanese. U. S. Sales only

Descriptors: *Laboratories, *Neutrons, *Reactors/ research.

For abstract, see NSA 27 06, number 11968.

LA-DC-72-1386 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
VISUALIZATION OF PION STOPPING REGION.
P. N. Dean. 3p CONF-721121-1
From National Meeting On Applications Of Optical Instruments In Medicine- Chicago, Il (29 Nov 1972).

Descriptors: *Mesons K, *Radiotherapy, *Tissues.

For abstract, see NSA 27 06, number 13798.

LBL-986 PC$3.00/MF$0.95
California Univ., Berkeley. Lawrence Berkeley Lab.
NEUTRON DOSIMETRY AT HIGH ENERGY PARTICLE ACCELERATORS- A REVIEW.
R. H. Thomas. Oct 72, 36p CONF-721203-7
Contract W-7405-ENG-48
From Symposium On Neutron Monitoring For Radiation Protection Purposes- Vienna, Austria (11 Dec 1972).

Descriptors: *Accelerators, *Neutrons, *Radiation protection.

For abstract, see NSA 27 06, number 12616.

LIB/TRANS-469 PC$3.00/MF$0.95
DOSE TO THE EPITHELIUM OF THE UPPER RESPIRATORY TRACT FROM RADON AND ITS DAUGHTER PRODUCTS.
A. V. Bykhovskii, D. G. Khachirov, N. G. Shishkanov, S. A. Dubrovin, and V. E. Klyuch. 17p
U. S. Sales only

Descriptors: *Bismuth isotopes bi-214, *Dogs, *Epithelium, *Lead isotopes pb-214, *Polonium isotopes po- 8, *Rabbits, *Radon isotopes rn- .

For abstract, see NSA 27 06, number 12361.

N73-16038 PC$6.25/MF$0.95
Missouri Univ., Columbia. Space Sciences Research Lab.
THE ROLE OF DEPRESSED METABOLISM IN INCREASED RADIO RESISTANCE.
Semiannual Status Report
X. J. Musacchia. 14 Sep 72, 81p NASA-CR-130381
Contract NGL-26-004-021

Descriptors: *Biological effects, *Gastrointestinal system, *Ionizing radiation, *Metabolism, *Physiological responses, Hamsters, Hypothermia, Radiation damage, Rats.

For abstract, see STAR 11 07.

N73-16077 PC$3.75/MF$0.95
Fraunhofer-gesellschaft Zur Forderung Der Angewandten Forschung E. V., Grafschaft (West Germany). Inst. Fuer Aerobiologie.
BIOLOGICAL EFFECTS OF FAST NEUTRONS. MORTALITY AND CHANGES IN BLOOD CELL COUNT OF MICE AFTER COMPLETE EXPOSURE TO FAST NEUTRONS AND X-RAYS . BIOLOGISCHE WIRKUNG SCHNELLER NEUTRONEN. MORTALITAET UND VERAENDERUNGEN IM BLUTBILD VON MAEUSEN NACH GANSKOERPERBESTRAHLUNG MIT SCHNELLEN NEUTRONEN UND ROENTGENSTRAHLEN.
F. J. Otto. 1972, 34p BMVG-FBWT-72-16
Subm- Sponsored By Bundesmin. Fuer Verteidigung

Descriptors: *Biological effects, *Blood, *Mice, *Neutron irradiation, Fast neutrons, Mortality, Radiation dosage, Radiobiology, X ray irradiation.

For abstract, see STAR 11 07.

ORNL-TR-2666 PC$3.00/MF$0.95
Kanazawa Univ., Ishikawa Prefecture (Japan).
DISTRIBUTION OF CADMIUM IN BIOLOGICAL MATERIALS. PART 1. HUMAN HAIR AND RICE STRAW.
Arinobu Ishizaki, Masaaki Fukushima, and Michiko Sakamoto. 12p

Descriptors: *Cadmium.

For abstract, see NSA 27 06, number 14415.

ORO-2066-16 PC$3.00/MF$0.95
Morehead State Univ., Ky.
GAMMA AND FAST NEUTRON SENSITIVITY OF TREE SEED AND SEEDLINGS. FINAL REPORT.
M. B. Heaslip. 1972, 49p
Contract AT (40-1)-2066

Descriptors: *Angiospermidae, *Gamma radiation, *Neutrons/ fast, *Seed, *Seedlings.

For abstract, see NSA 27 06, number 12295.

SAN-753 PC$3.00/MF$0.95
San Francisco Operations Office (Aec), Calif.
FINAL TECHNICAL REPORT (ON BIOLOGICAL RADIATION EFFECTS).
George Austin. 22 Dec 72, 2p
Contract AT (04-3)-753

Descriptors: *Cells, *Mammalia, *Mollusca, *Nervous system, *X radiation.

For abstract, see NSA 27 06, number 12332.

TID-26237 PC$3.00/MF$0.95
City Coll., New York. Dept. Of Physics.
INTEGRO-DIFFERENTIAL EQUATION ANALYSIS OF NON-CONTIGUOUS PARTIALLY COMPARTMENTED SYSTEMS AND PRACTICAL DEVELOPMENT OF NEW RADIOISOTOPE IMAGING AND DATA PROCESSING TECHNIQUES. PROGRESS REPORT.
Hiram Hart. 1972, 235p
Contract AT (11-1)-3253

Descriptors: *Radioisotope scanning.

For abstract, see NSA 27 06, number 14440.

UCRL-74247 PC$3.00/MF$0.95
California Univ., Livermore. Lawrence Livermore Lab.
USE OF /SUP 10/B-LOADED PLASTIC IN PERSONNEL NEUTRON DOSIMETRY.
R. V. Griffith. 9 Oct 72, 21p CONF-721203-6

From Symposium On Neutron Monitoring For Radiation Protection Purposes- Vienna, Austria (11 Dec 1972).

Descriptors: *Neutrons, *Radiation detectors/ activation, *Radiation detectors/ dielectric track, *Radiation dosimeters/ thermoluminescent, *Radiation filters.

For abstract, see NSA 27 06, number 12109.

6S. Stress Physiology

AD-757 239 PC$3.00/MF$0.95
Civil Aeromedical Inst Oklahoma City Okla
AUDITORY EFFECTS OF NOISE ON AIR-CREW PERSONNEL,
Jerry V. Tobias. Nov 72, 10p* FAA-AM-72-32

Descriptors: (*Aviation personnel, *Noise), (*Hearing, Thresholds (Physiology)), Pilots, Aviation medicine, Cockpits, Protection, Flight crews.

Hearing-threshold tests were made on flight personnel of several sorts, including aerial-application pilots, flight instructors, private pilots, stewardesses, and FAA flight inspectors. Excluding those people whose flight experience is of short duration, each group shows some measurable degree of threshold shift, although this shift is frequently not enough to be regarded as a clinically significant entity. Data on the sorts of noise exposures each group commonly receives are presented, and some cautions are offered regarding interpretation of the data. (Author)

AD-757 322 PC$3.00/MF$0.95
Naval Submarine Medical Research Lab Groton Conn
METHEMOGLOBIN FORMATION IN HUMANS DURING EXPOSURE TO HYPERBARIC OXYGEN IN A STANDARD NAVY DECOMPRESSION TREATMENT TABLE.
Rept. no. 1 (Final),
Stephen C. Wood, Joseph D. Bloom, and Arthur A. Messier. 30 Jul 71, 12p Rept no. NSMRL-676

Descriptors: (*Hemoglobin, Oxygen consumption), (*Oxygen consumption, High-pressure research), Pressure breathing, Tissues (Biology), Respiration, Decompression.
Identifiers: *Hyperbaric oxygenation, *Oxygen transport mechanisms, Hyperbaric medicine.

An investigation was conducted to determine whether oxygen breathing at pressures greater than IATA had any deleterious effects on oxygen transport in humans. Two male subjects were exposed to Standard Navy Decompression Treatment Table 6 which prescribes O2 breathing at 60 FSW and 30 FSW with air breathing intervals to allay O2 induced pulmonary toxicity. Blood samples were obtained during the decompression table. There were significant changes in both subjects in the concentration of methemoglobin which increased from control values of 1 to 4% to 7 to 9% of total hemoglobin at 60 FSW and 6 to 8% at 30 FSW and returned to control values upon surfacing. Previous studies performed elsewhere in which this parameter was determined concluded that hemoglobin oxidation does not result from breathing OHP. These conclusions, however, were based on pre- and post-exposure measurements only. The findings of this study are significant in view of the known bimodal influence of methemoglobin on oxygen transport: decreased O2 capacity and a shift of the oxygen dissociation curve to the left. Levels of methemoglobin of 7.6% have been shown to significantly reduce O2 delivery to tissues on which the partial pressure of O2 (PO2) is 30 mm Hg or less. This would include cardiac and cerebral tissue. (Author)

AD-757 323 PC$3.00/MF$0.95
Naval Submarine Medical Research Lab Groton Conn
ELECTROENCEPHALOGRAPHIC CHANGES DURING SATURATION EXCURSION DIVES TO A SIMULATED SEAWATER DEPTH OF 1000 FEET.
Interim rept. no. 6,
L. D. Proctor, C. R. Carey, R. M. Lee, K. E. Schaefer, and H. van den Ende. 11 Nov 71, 31p
Rept no. NSMRL-687

Descriptors: (*Electroencephalography, *Diving), Decompression, Stress (Physiology), Central nervous system, Performance (Human), Hyperventilation, Nitrogen, Oxygen, Respiration, High-pressure research.
Identifiers: Hyperbaric atmospheres, Narcosis.

EEG records were obtained in two Ss during saturation excursion dives to 1000 ft. depth. Computer analysis porudced the following findings. During the compression to saturation depth of 800 ft. at a rate of 3.5 ft./min similar EEG changes were observed in both Ss consisted of : (1) lowering of the mean frequency, (2) decrease in the percentage of fast waves (18 - 50 Hz), (3) increase in the percentage of 6 - 8 Hz waves (theta activity). During the subsequent saturation period at 800 ft. the EEG changes observed during the compression to 800 ft. were reversed within 14 hours in S C.D. and 18 hours in S D.F. which indicated that the EEG changes found during the compression phase represent a compression syndrome. During the latter part of the 36 hours saturation period at 800 ft. and the subsequent decompression period S C.D. exhibited a consistent decrease in mean frequency and an increase in percent of 6-8 Hz frequency (theta activity) which appeared to be correlated with an increase in CO2 excretion in the urine and a decrease in alvelor CO2 tension suggesting a hyperventilation effect. Inhalation of nitrogen-oxygen mixtures (3.5 Atm N2, 1.4 Atm O2) at different depth levels during compression produced in both subjects symptoms of narcosis, performance detoriation and EEG changes at the lower depth level. At greater depth levels no symptoms of narcosis or performance changes were observed but slight changes in the EEG occurred. (Author)

AD-757 334 PC$3.00/MF$0.95
Naval Submarine Medical Research Lab Groton Conn
ACCOMMODATION AND STEREOACUITY.
Interim rept. no. 10,
Saul M. Luria, and Jo Ann S. Kinney. 5 Jun 72, 17p
Rept no. NSMRL-711

Descriptors: (*Diving, Vision), (*Visual acuity, Underwater), Tests, Eye, Adaptation (Physiology), Resolution, Lenses, Protective mask facepieces.
Identifiers: *Underwater vision.

Stereoacuity and resolution acuity were measured through apertues set at various distances from the subjects and through plus lenses producting an accommodative error for the target equal to that produced by the presence of the apertures. Stereoacuity was degraded by the apertures but not by the lenses, whereas resolution acuity was degraded by the lenses but not by the apertures. Although stereoacuity progressively declined with decreasing target-distance, it did not change significantly if accommodation remained constant. The decline of stereoacuity in the water is attributed to increased accommodation resulting from different sources and to the paucity of visual stimulation which is typical of the underwater scene and which is known to disrupt many visual processes (the so-called 'Ganzfeld' effect). (Author)

AD-757 337 PC$3.00/MF$0.95
Naval Submarine Medical Research Lab Groton Conn
HEARING LOSS AT 3 KILOHERTZ AND THE CHABA 'PROPOSED CLINICAL TEST OF SPEECH DISCRIMINATION IN NOISE'.
Interim rept. no. 8,

C. K. Myers, and Cynthia Angermeier. 27 Jul 72, 10p Rept no. NSMRL-720

Descriptors: (*Speech, Intelligibility), (*Noise, Stress (Physiology)), (*Naval personnel, Noise), Communication systems, Auditory acuity, Audiometry, Performance (Human), Naval research, Medical research.
Identifiers: *Speech discrimination.

Forty-eight young men, 21 with rather sharp audiometric losses above 2 kiloHertz, were given a standard test of monayllables in noise. On the average, these 47 men scored 10 fewer words correct per 100 than has been reported for normal controls. Scattergrams of performance vs a variety of pure-tone and speech threshold data, however, showed that no audiometric information could predict performance in noise. It was concluded that the standardized speech-in-noise test itself should be considered as the predictor instead of threshold tests, and that it should be validated against actual job performance. (Author)

AD-757 338 PC$3.00/MF$0.95
Naval Submarine Medical Research Lab Groton Conn
A COMPARISON OF SPEECH DISCRIMINATION ABILITY FOR SIMULATED AND REAL HEARING LOSS AT 3 AND 6 KHZ,
Russell L. Sergeant, and Thomas Murry. 28 Jul 72, 13p Rept no. NSMRL-721

Descriptors: (*Speech recognition, Deafness), (*Deafness, Noise), Voice communication systems, Military personnel, Submarine personnel, Auditory perception, Stress (Physiology).

Enlisted submariners with high-frequency hearing loss (ave. of 22, 45 and 60 decibels at 3, 4 and 6 kiloHertz, respectively) performed poorer than a normal-hearing control group by 6.2 percentage points on rather easy tests of speech intelligibility, and by 5 percentage points on rather difficult tests containing speech in background noise. The performance of the hearing-loss group, however, for the easier tests exceeded by 12.7 points that of another normal-hearing control group in which the hearing loss was simulated by filtering. The hearing-loss subjects may be experience have compensated to some extent in easier situations for their defect. This was not true for the more difficult situations. (Author)

JPRS-58292 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
MATHEMATIC ANALYSIS OF THE REACTIONS OF THE HUMAN RESPIRATORY SYSTEM TO HYPOXIA AND HYPERCAPNIA,
I. S. Breslav, A. G. Zhironkin, V. N. Salazkin, and A. M. Shmeleva. 22 Feb 73, 13p
Trans. of Fiziologicheskii Zhurnal SSSR, v58 n11 p1749-1755 1972.

Descriptors: (*Hypercapnia, Respiratory system), (*Hypoxia, Respiratory system), (*Respiratory system, Stress (Physiology)), Regression analysis, Correlation, Respiration, Physiology, Translations, USSR.

The report contains a study of man's ventilatory reactions to the inhalation of hypoxic and hypercaptic mixtures as studied in 300 experiments and mathematically processed by multiple correlation and regression analysis. These equations can be used to assess the relative importance of hypoxic and hypercapnic stimuli in the regulation of human breathing.

JPRS-58345 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
ALL-UNION CONFERENCE ON SPACE BIOLOGY AND MEDICINE (4TH) HELD AT KALUGA,
N. Gurovskii, and M. Kozar. 28 Feb 73, 8p
Trans. from Meditsinskaya Gazeta (USSR) p3, 19 Jan 73.

Descriptors: (*Exobiology, *USSR), (*Aerospace medicine, Meetings), Stress (Physiology), Spacecraft environments, Confined atmospheres, Respiration, Blood circulation, Oxygen, Rare gases.

The report contains a review of the materials presented at the Fourth All-Union Conference on Space Biology and Medicine held in Kaluga. A total of 254 reports were presented at three plenary and 24 section meetings. (Author)

JPRS-58358 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
SOME RESULTS OF STUDIES OF HIGH ALTITUDE PHYSIOLOGY OF MAN IN TIEN SHAN AND THE PAMIRS AND PROSPECTS FOR FURTHER RESEARCH,
M. M. Mirrakhimov. 1 Mar 73, 18p
Trans. of Fiziologicheskii Zhurnal SSSR, v58 n12 p1816-1826 1972.

Descriptors: (*Stress (Physiology), High altitude), Blood circulation, Adaptation, Respiration, Hyperventilation, Hypertension, USSR.
Identifiers: Tien Shan Mountains, Pamirs Mountains, High altitude physiology.

The report contains a summary of research concerning high altitude adaptation of man, conducted by the author and the collective directed by him. (Author)

N73-16066 PC$4.00/MF$0.95
Union Carbide Research Inst., Tarrytown, N.Y. Environmental Physiology Lab.
PREDICTIVE MODELING OF ALTITUDE DECOMPRESSION SICKNESS IN HUMANS.
Final Report
D. J. Kenyon, R. W. Hamilton, Jr., I. A. Colley, and H. R. Schreiner. 19 Dec 72, 39p
NASA-CR-114550
Contract NAS2-6697

Descriptors: *Data acquisition, *High altitude tests, *Human reactions, *Pressure chambers, Coding, Decompression sickness, Digital techniques, Statistical analysis.

For abstract, see STAR 11 07.

N73-16070 PC$4.25/MF$0.95
Deutsche Forschungs- Und Versuchsanstalt Fuer Luft- Und Raumfahrt, Bad Godesberg (West Germany). Inst. Fuer Flugmedizin.
THE EFFECTS OF HYPOXIA AND ACCELERATION ON ENZYME ACTIVITIES IN ERYTHROCYTES AND PLASMA . DIE AUSWIRKUNG VON SAUERSTOFFMANGEL UND BESCHLEUNIGUNG AUF EINIGE ENZYMAKTIVITAETEN IM ERYTHROZYTEN UND IM PLASMA.
Ph.D. Thesis - Bonn Univ.
I. Carl. Sep 72, 45p DLR-FB-72-71
Language German English Summary

Descriptors: *Acceleration stresses (physiology), *Enzyme activity, *Hypoxia, Blood plasma, Erythrocytes.

For abstract, see STAR 11 07.

N73-16823 PC$6.00/MF$0.95
Fordham Univ., New York.
APOLLO 15 TIME AND MOTION STUDY.
Final Report
J. F. Kubis, J. T. Elrod, R. Rusnak, and J. E. Barnes. Jan 72, 77p NASA-CR-128695, M72-4
Contract NAS9-11839

Descriptors: *Apollo 15 flight, *Astronaut performance, *Lunar exploration, Astronaut training, Extravehicular activity, Metabolism.

For abstract, see STAR 11 07.

N73-16825 PC$5.75/MF$0.95
Fordham Univ., New York.
APOLLO 16 TIME AND MOTION STUDY.
Final Mission Study
J. F. Kubis, J. T. Elrod, R. Rusnak, J. E. Barnes, and S. C. Saxon. Jul 72, 71p NASA-CR-128696, M72-6
Contract NAS9-11839

Descriptors: *Apollo lunar surface experiments package, *Apollo 16 flight, *Astronaut performance, Astronaut training, Extravehicular activity, Lunar roving vehicles, Metabolism.

For abstract, see STAR 11 07.

6T. Toxicology

AD-757 154 PC$3.00/MF$0.95
Edgewood Arsenal Md
STUDIES OF SPONTANEOUS RECOVERY OF CENTRAL RESPIRATORY FUNCTION AFTER ACETYLCHOLINESTERASE INHIBITION BY ORGANOPHOSPHATES.
Technical rept. Jan 71-Jan 72,
George K. Adams, John F. O'Leary, and Henry I. Yamamura. Jan 73, 37p Rept no. EA-TR-4677

Descriptors: (*Organic phosphorus compounds, *Toxicity), (*Respiratory system, Organic phosphorus compounds), (*Sarin, Respiratory system), (*Soman, Respiratory system), Recovery, Respiration, Acetylcholinesterase, Paralysis, Nervous system, Chemical warfare agents.

Spontaneous recovery of the central respiratory function was studied in anesthetized guinea pigs intoxicated with either pinacolyl methylphosphonofluoridate (Soman) or isopropyl methylphosphonofluoridate (Sarin). The animals were pretreated with atropine methylnitrate to protect muscarinic sites outside of the central nervous system. The intravenous administration of either Soman (38 micro g/kg) or Sarin (80 micro g/kg) produced an immediate disruption of phrenic nerve activity and resulting ventilatory failure. Animals were maintained on artificial respiration until spontaneous functional recovery was complete, as evidenced by the reestablishment of the synchronized burst of activity in the phrenic nerve and the return to tracheal airflow. This usually occurred within 1 hour. To determine whether the spontaneous recovery of respiration and the return of brainstem acetylcholinesterase (AChE) activity could be correlated, animals were sacrificed at predetermined intervals after intoxication, and the brainstem homogenates were analyzed for AChE activity. Results showed no significant return of AChE activity after 1 hour, although functional recovery of respiration was complete within this time. (Author Modified Abstract)

COM-73-50210 PC-GPO/MF$0.95-NTIS
National Bureau of Standards, Washington, D.C. Center for Building Technology.
THE NBS LEAD PAINT POISONING PROJECT: HOUSING AND OTHER ASPECTS.
Final rept.,
Harvey W. Berger. Feb 73, 26p NBS-TN-759
Paper copy available from GPO $0.30 as C13.46:759.

Descriptors: (*Lead poisoning, Paints), Residential buildings, Children, Ingestion (Biology), Hazards, Detection.
Identifiers: *Lead paint poisoning, Deleading, Lead Based Paint Poisoning Prevention Act.

The National Bureau of Standards is providing technical support required by the Department of Housing and Urban Development to carry out its research responsibilities under PL 91-695, The Lead Based Paint Poisoning Prevention Act. The program at NBS has involved three major areas of research: An estimation of the numbers of children at risk and with excessive body burdens of

lead and the geographical distribution of those children; the capabilities and characteristics of analytical methods for the detection of lead in paint and other building materials and the identification and evaluation of materials, techniques and systems for removing or eliminating the lead paint hazard from housing. This paper is a brief presentation of the activities and conclusions of NBS in the areas listed above. (Author)

PB-216 419/2 PC$6.00/MF$0.95
Little (Arthur D.), Inc., Cambridge, Mass.
SINGLE-AND REPEATED-DOSE TOXICITY OF 3-TRITYLTHIO-L-ALANINE CLINICAL FORMULATION (NSC 83265) ADMINISTERED IN DOGS AND MONKEYS BY THE INTRAVENOUS ROUTE.
Final rept.,
Paul E. Palm, Michael W. Rohovsky, Elsie P. Arnold, and Peter C. Rachwall. 15 Feb 73, 410p
ADL-NCI-73-40, ADL-C-75400-30
Grant NSF-CM-33727

Descriptors: (*Antineoplastic agents, *Toxicology), (*Drugs, Toxicology), (*Malignant neoplasms, Drugs), (*Alanines, Antineoplastic agents), Bioassay, Dogs, Monkeys, Dose rate, Dosage, Lethal dosage, Parenteral infusions, Liver, Kidneys, Bone marrow, Hematology, Blood chemical analysis, Cysteine, Amino acids.
Identifiers: *Alanine/tritylthio.

Data are presented from four studies conducted to evaluate the intravenous toxicity of the anticancer agent, NSC 83265 Clinical Formulation in dogs and monkeys. The drug was administered to dogs on dosage regimens of x 5 and x (5 (9)5 (9)5), and x 1 and x 5 in monkeys. Lethal doses determined by each of the regimens were 50 mg/kg x 4, 25 mg/kg x 5 (9)5, 100 mg/kg x 1 and 50 mg/kg x 3, respectively. The highest non-toxic dose was 6.25 mg/kg when administered by the first three regimens above and 0.78 mg/kg by the last. On this basis for comparison, the drug appeared to be 4-8 times as toxic to the monkey as to the dog. The liver was the primary site of toxicity in both species with abnormalities in the hematological and urinary systems of secondary importance. SGPT, SGOT and alkaline phosphatase parameters, in that order, appeared to be the earliest and most reliable indicators of toxicity from the drug.

7. CHEMISTRY

7A. Chemical Engineering

ORNL-TM-4000 PC$3.00/MF$0.95
Oak Ridge National Lab., Tenn.
SEPARATIONS PROCESSES. WATER RESEARCH PROGRAM BIENNIAL PROGRESS REPORT FOR THE PERIOD MARCH 15, 1966--MARCH 15, 1968.
J. S. Johnson Jr, and G. E. Moore. Nov 72, 170p
Contract W-7405-ENG-26

Descriptors: *Desalting, *Filtration, *Membranes, *Separation processes.

For abstract, see NSA 27 06, number 11723.

PB-216 329/3 PC$5.45/MF$0.95
Applied Technology Corp., Pittsburgh, Pa.
SO2 FREE TWO-STAGE COAL COMBUSTION PROCESS. APPENDICES.
Aug 72, 122p* EPA-R2-72-035a
Contract CPA-70-146
Appendicies to PB-211 888.

Descriptors: (*Coal gasification, *Desulfurization), (*Liquid metals, Desulfurization), (*Air pollution, *Sulfur dioxide), (*Coal, Desulfurization), (*Combustion chambers, Design), (*Electric power plants, *Air pollution control equipment), Construction, Slags, Combustion products, Iron, Comminution, Cost estimates, Operating costs, Capitalized costs, Manufactured gas, Regeneration (Engineering), Carbon monoxide.
Identifiers: *Air pollution control, Waste gas recovery.

The volume contains the appendices to the report entitled, 'SO2 Free Two-Stage Coal Combustion Process Progress Report' (PB-211 888). This previous report discussed the design of a coal gasification process for electric power plants in which coal is injected into molten iron to produce carbon monoxide fuel gas and a sulfur containing slag. Appendix A is a discussion of the experimental combustor design, construction, and operation. Appendix B details the laboratory work conducted for the study. In Appendix C is presented the Two-Stage Coal Combustion Process simulation and economic evaluation.

PB-217 106/4 PC$3.00/MF$0.95
Processes Research, Inc., Cincinnati, Ohio. Industrial Planning and Research.
AIR POLLUTION FROM NITRATION PROCESSES.
31 Mar 72, 180p* APTD-1071
Contract EPA-CPA-70-1

Descriptors: (*Air pollution, *Nitrogen oxides), (*Chemical industry, Air pollution), (*Nitration, Air pollution), Process charting, Chemical reactions, Oxidation, Forecasting, Materials recovery, Raw materials, Nitric acid, Tables (Data), Ammonium nitrate, Adipic acid, Phthalic acids, Acrylonitriles, Nitrobenzenes, Oxalic acid, Dinitrotoluene, Nitro compounds, Cellulose nitrate, Nitroglycerine, Potassium nitrate, Sodium nitrates, TNT.
Identifiers: Waste gas recovery, Air pollution control, *Emission factors, Benzene/chloro-nitro.

Using 1970 as the key year, the report covers the air pollution by processes which use nitric acid. It does not cover air pollution by nitric acid production, or the nitric acid treatment by the fertilizer industry of phosphate rock. The study identifies the air pollutants from 15 selected major nitration processes, estimates the present and future quantities of pollutants, evaluates the applicability of control devices presently used in nitric acid production for controlling the air pollutants from the nitration processes, and recommends research and development objectives for the monitoring and controlling of these air pollutants. The compounds produced and which are covered include: Ammonium nitrate; Adipic acid; Terephthalic acid; Acrylonitrile; Nitrobenzene; Dinitrotoluene; Nitrochlorobenzene; Oxalic acid; Nitroparaffins; Nitrocellulose; Nitroglycerine; Trinitrotoluene; Potassium nitrate; and Sodium nitrite.

7B. Inorganic Chemistry

AD-757 231 PC$3.00/MF$0.95
Mcdonnell Douglas Astronautics Co Huntington Beach Calif
THERMOCHEMISTRY OF HIGH TEMPERATURE GASEOUS COMPOUNDS OF METALS.
Final technical rept. 1 Jun-15 Aug 72,
Donald L. Hildenbrand. 15 Aug 72, 5p AFOSR-TR-73-0435
Contract F44620-72-C-0074

Descriptors: (*Fluorides, *Thermochemistry), (*Tungsten compounds, Thermochemistry), Mass spectroscopy, Oxides, Sulfur compounds.
Identifiers: *Tungsten fluorides, Sulfur hexafluoride.

Measurements were made by high temperature mass spectrometry, both equilibrium and electron impact studies, to obtain thermochemical data for gaseous compounds of refractory metals. Gaseous SF6 was admitted to a tungster effusion cell, equilibrium was established at 1600K and gaseous products of WF6, WF5, WF4, WSF2, WSF3, WSF4, WS2F2 and WOSF2 were identified and characterized. (Author)

AD-757 346 PC$3.00/MF$0.95
California State Univ Los Angeles Dept of Chemistry
CHEMICAL AND STRUCTURAL STUDIES ON THE 2,4- AND 2,3-ISOMERS OF THE DICARBA-NIDO-HEXABORATE (1-) ION, C2B4H7 (-), AND SOME DIPOLAR DERIVATIVES.
Technical rept.,
Thomas Onak, Bill Lockman, and Gerrard Haran.
Mar 73, 23p Rept nos. TR-10, Proj-39
Contract N00014-71-C-0072

Descriptors: (*Borates, Synthesis (Chemistry)), Molecular structure, Nuclear magnetic resonance, Ammonium compounds, Lithium compounds, Complex compounds, Salts.
Identifiers: *Carboranes, *Borate (-1)/hexahydrodicarba-nido-hexa, *Borate (-1)/heptahydro-dicarba-nido-hexa, Addition compounds.

The closo carborane 1,6-C2B4H6 reacts with trimethylamine to form 5-Me3N (+)-nido-2,4-C2B4H6 (-). The latter compound rearranges in chloroform, or thermally, to the 3-Me3N (+) -isomer. The parent 2,4-C2B4H7 (-) ion is obtained both from the action of NaH on either 3- or 5-Me3N (+) -2,4-C2B4H6 (-) and from the slow reaction of closo-1,6-C1B4H6 with either NaH or LiH. The structure of 2,4-C2B4H7 (-) and 2,3-C2B4H7 (-) and the Me3N (+) -2,4-C2B4H6 (-) isomers are correlated with 11B and (1)H nmr data. (Author)

AD-757 694 PC$3.00/MF$0.95
Wisconsin Univ Madison Dept of Chemistry
NEW METALLOBORANES. (MN (CO)3 (B9H13))- AND MN (CO)3 (B9H12 (OC4H8)).
Technical rept.,
John W. Lott, Donald F. Gaines, H. Shenhav, and R. Schaeffer. Mar 73, 10p Rept no. TR-6
Contract N00014-67-A-0128-0008
Prepared in cooperation with Indiana Univ., Bloomington. Dept. of Chemistry.

Descriptors: (*Boron compounds, Chemical reactions), Molecular structure, Chemical bonds, Metal carbonyls, Manganese compounds, Spectra (Infrared), X-ray diffraction analysis.

Two examples of a new class of air-stable metalloboranes are reported. An X-ray study of Mn (CO)3 (B9H12 (OC4H8)) verifies a decaborane-like structure in which the Mn (CO)3 moiety occupies a boron position. (Author)

AD-757 695 PC$3.00/MF$0.95
Wisconsin Univ Madison Dept of Chemistry
THE SYNTHESIS AND MOLECULAR STRUCTURE OF A METALLOBORANE 'ZWITTERION' MN (CO)3 (B9H12 (O (CH2)4N (C2H5)3)).
Final technical rept.,
Donald F. Gaines, John W. Lott, and Joseph C. Calabrese. Mar 73, 9p Rept no. TR-7
Contract N00014-67-A-0128-0008

Descriptors: (*Boron compounds, Chemical reactions), Molecular structure, Metal carbonyls, Amines, Manganese compounds, Complex compounds, Ions.
Identifiers: *Zwitterions, *Addition compounds.

Reaction of Mn (CO)3 (B9H12 (THF)) with triethylamine produces the zwitterion Mn (CO)3 (B9H12 (OCH2)4N (C2H5)3), the structure of which has been determined by X-ray crystallography. (Author)

CEA-R-4347 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Saclay (France). Centre D'Etudes Nucleaires.
STUDY OF POLYANIONS SUBSTITUTED BY ZR OR OTHER ELEMENTS OF THE SAME GROUP.
Christine Fauris. Nov 72, 113p
Lang- In French. Thesis. U. S. Sales only

Descriptors: *Germanium, *Molybdenum, *Phosphorus, *Silicon, *Tungsten, *Zirconium.

For abstract, see NSA 27 06, number 11742.

IS-T-545 PC$3.00/MF$0.95
Ames Lab., Iowa.
SYNTHESIS AND REACTIONS OF CARBAMOYL AND ALKOXYCARBONYL COMPLEXES OF MANGANESE AND RHENIUM.
R. W. Brink. Nov 72, 77p
Contract W-7405-ENG-82
Thesis.

Descriptors: *Manganese, *Rhenium.

For abstract, see NSA 27 06, number 14383.

IS-T-550 PC$3.00/MF$0.95
Ames Lab., Iowa.
REACTIONS OF SOME TRANSITION METAL COMPLEXES.
T. R. Webb. Nov 72, 135p
Contract W-7405-ENG-82
Thesis.

Descriptors: *Rhenium.

For abstract, see NSA 27 06, number 14384.

JPRS-58293 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
SELENIDES,
V. A. Obolonchik. 22 Feb 73, 21p
Trans. of mono. Selenidy, Moscow, 1972 p117-131, 273-280.

Descriptors: (*Selenides, Reviews), USSR, Zinc selenides, Chemical reactions, Cadmium selenides, Crystal lattices, Phase transformations, Crystal defects, Translations.
Identifiers: Mercury selenides.

The report contains excerpts on selenides of the zinc subgroup metals and on the applications of selenides. (Author)

N73-16110 PC$3.00/MF$0.95
Kanner (Leo)Associates, Redwood City, Calif.
STABILITY OF AQUEOUS SOLUTIONS OF HCN IN THE PRESENCE OF AMMONIA OR AMMONIA AND CO2.
S. Fujise, S. Nagai, and T. Numata. Feb 73, 12p
NASA-TT-F-14691
Contract NASW-2481
Tran- Transl. Into English From Kogyo Kagaku Zasshi (Tokyo), V. 64, No. 11, 1961 P 1889-1891

Descriptors: *Acids, *Ammonia, *Carbon dioxide, *Stabilizers (agents), *Synthesis, Chemical equilibrium, Chemical reaction control, Polymerization.

For abstract, see STAR 11 07.

RCN-178 PC$3.00/MF$0.95
Reactor Centrum Nederland, Petten.
DETERMINATION OF CHLORINE AND FLUORINE IN URANIUM DIOXIDE.
J. G. Van Raaphorst, A. Tolk, W. A. Lingerak, and A. J. P. Groen. Jun 72, 17p
U. S. Sales only

Descriptors: *Chlorine, *Fluorine, *Uranium oxides uor.

For abstract, see NSA 27 06, number 11683.

7C. Organic Chemistry

AD-757 155 PC$3.00/MF$0.95
Edgewood Arsenal Md
GAS-LIQUID CHROMATOGRAPHIC ASSAY OF 1,2,3-TRIMERCAPTOPROPANE IN DIMERCAPROL.
Technical rept. Apr 68-Mar 72,
Aubrey E. Cooper, and Albert A. Kondritzer. Mar 73, 14p Rept no. EA-TR-4687

Descriptors: (*Thiols, *Gas chromatography), Impurities, Propanols.
Identifiers: *Dimercaprol, *Propane trithiols.

The report provides a description of studies conducted, using the technique of gas-liquid chromatography, to determine if 1,2,3-Trimercaptopropane (TSH) is present to an extent greater than 1.5 percent in lots of dimercaprol (BAL), which is used in the formulation of FSN 6505-108-8500 Dimercaprol Injection, USP, 10 percent 5 cc. Satisfactory results were obtained using an 18-foot glass column, SE-30 liquid support, and isothermal operation. (Author)

AD-757 158 PC$3.00/MF$0.95
Edgewood Arsenal Md
MASS SPECTRA OF METHYLPHOSPHONIC DIHALIDES, N,N--DIMETHYLAMINOVPHOSPHOROAMIDIC DIHALIDES AND THEIR SUFLUR ANALOGS.
Technical rept. Nov 70-Jul 71,
Lester W. Daasch. Mar 73, 24p Rept no. EA-TR-4714

Descriptors: (*Organic phosphorus compounds, Mass spectrum), Halides, Sulfur compounds, Decomposition.
Identifiers: *Phosphonic difluoride/methyl, *Phosphonic dichloride/methyl, *Phosphoramidic difluoride/N-N-dimethyl, *Phosphoramidic dichloride/N-N-dimethyl, *Phosphoramidothioic difluoride/N-N-dimethyl.

The mass spectra of methyphosphonic difluoride and dichloride and N,N-dimethylaminophosphoroamide difluoride and dichloride and their sulfur analogs are presented. Fragmentation paths which lead to most of the intense peaks in these spectra are suggested. Metastable data support many of these proposed fragmentations. Mass determinations at a resolution of m/delta m of 2500 and isotope patterns positively identify some of the empirical formulas. Labile hydrogens, trivalent phosophorus structures in the excited ions, and extensive rearrangement are indicated by the data. (Author)

AD-757 303 PC$3.00/MF$0.95
Explosives Research and Development Establishment Waltham Abbey (England)
THE SETTING POINT OF DIMETHYL PHTHALATE (DMP) AS A CRITERION OF ITS PURITY.
Technical note,
W. E. Batty. Nov 72, 10p Rept no. ERDE-TN-34
DRIC-BR-33549

Descriptors: (*Phthalates, Impurities), (*Crystallization, Phthalates), Test methods, Great Britain.
Identifiers: *Phthalic acid/ (dimethyl-ester).

Experimental details and results are given for se ting point determinations on dimethyl phthalate (DMP) samples. The results indicate that this is a satisfactory and sensitive method. (Author)

AD-757 307 Reprint
Stanford Univ Calif Dept of Materials Science and Engineering
ELECTRICAL CONDUCTIVITY OF 1,3-DI-(METHOXYPHOSPHONIC ACID)BENZENE POLYELECTROLYTES,
Richard A. Wallace, John L. Crowley, and N. V. Vijayraghavan. 4 Aug 72, 5p Rept no. TR-6
Contract N00014-67-A-0112-0067
Availability: Pub. in Jnl. of Polymer Science: Polymer Chemistry Edition, v10 n11 p3447-3450 1972.

Descriptors: (*Phosphonic acids, Electrical conductance), (*Plastic coatings, Electrical conductance), Temperature, Films, Protons.
Identifiers: *Polyelectrolytes, *Ionic mobility, *Poly (phenylene/bis (phosphonomethoxy)-methylene).

Direct-current measurements have been employed to study the mechanism of protonic transport in dry ionic polymer films. Recent studies indicate conduction in dry ionic polymers takes place by means of an ion-hopping mechanism. Electrical conductance measurements have been used to determine the effects of glass transition on the protonic transport in polystyrene sulfonate membranes. No investigations have been carried out on the mechanism of ion conductance within dry phosphonic acid polymer films. In the note, the authors report the influence of temperature on the specific conductance of 1,3-di (methoxyphosphonic acid)benzene polyelectrolyte films. The transport mechanism of hydrogen ion conduction in these dry phosphonic acid polymer films is explained. The experimental activation energy for the protonic conduction process is also reported. (Author Modified Abstract)

AD-757 345 PC$3.00/MF$0.95
Belfer Graduate School of Science New York
SOME NOVEL ORGANOANTIMONY (V) COMPOUNDS.
Technical rept.,
Ming-May Y. Cheng, Kai Su, and Jeremy I. Musher. 20 Feb 73, 8p Rept no. TR-5
Contract N00014-68-A-0302-0005

Descriptors: (*Antimony compounds, *Metalorganic compounds), Esters, Phthalates.
Identifiers: *Antimony organic compounds.

A novel series of antimony (V) molecules is prepared. These all utilize the triphenylantimony group to which is added two organic active groups generally of the form -OOC-X-COOCH3. The products are all stable and can be used in various other reactions. (Author)

AD-757 376 MF$0.95
Bishop Coll Dallas Tex
RADIATION-INDUCED GRAFTING ON POLYAMIDES.
Technical rept.,
J. E. Wilson. Mar 73, 39p Rept no. TR-2
Contract N00014-72-C-0052
Availability: Available in microfiche only.

Descriptors: (*Halocarbon plastics, *Polymerization), (*Polamide plastics, Polymerization), (*Nylon, Polymerization), Radiation chemistry, Organic solvents, Solvent action, Styrene plastics, Films.
Identifiers: *Graft polymerization, *Radiation polymerization, *Fluorinated polymers, *Poly ((ethylene/tetrafluoro)- (phenylene/tetrafluoro)), *Polymeric films.

The report describes the continuation of the investigation of the radiation-induced grafting of fluorinated monomers on polyamide films. One objective of the present work was to investigate the nature of the accelerating effect of methanol, and the effect of added solvents in general. Another objective was to study the properties of nylon films containing grafted PFS. Experimental approaches induced the comparison of grafting rates for the PFS/nylon system with those for PFS/polyethylene, styrene/nylon, and styrene/polyethylene. (Author Modified Abstract)

AD-757 416 PC$3.00/MF$0.95
Belfer Graduate School of Science New York
INTRAMOLECULAR REARRANGEMENTS IN PHOSPHORANES VIA BIMOLECULAR INTERMEDIATES.
Technical rept.,
Jeremy I. Musher. 20 Feb 73, 6p Rept no. TR-4
Contract N00014-68-A-0302-0005

Descriptors: (*Organic phosphorus compounds, Chemical reactions), Stereochemistry.

Identifiers: *Phosphoranes, *Rearrangement reactions.

Intramolecular rearrangements of phosphoranes are discussed. It is suggested that the molecules rearrange by forming either nonsymmetric dimers or by complexing with polar solvent molecules. (Author)

AD-757 423 PC$3.00/MF$0.95
Grumman Aerospace Corp Bethpage N Y Research Dept
AN INVESTIGATION OF METAL-CONTAINING POLYIMIDE FILMS BY INFRARED SPECTROSCOPY METHOD,
I. Ya. Ravich, O. V. Neklyudova, T. N. Toroptseva, and L. G. Gindin. Feb 73, 13p Rept no. TR-62
Research trans. of Zhurnal Prikladnoi Spektroskopii (USSR) v9 n4 Oct 68, by Algirdas Maciyulaitis.

Descriptors: (*Plastic coatings, Additives), (*Spectra (Infrared), *Imides), Silver, Silver compounds, Heat treatment, Molecular structure, Films, Complex compounds, USSR.
Identifiers: *Polyimide resins, *Polymeric films, *Poly ((benzodipyrrolediyl/dihydro-tetraoxo)-phenylene-oxy-phenylene), Cyclization, Translations, *Rearrangement reactions.

Contemporary technology has created a need for polymers possessing high thermal stability as well as increased electrical and thermal conductivities and magnetic permeability. This Russian paper deals with attempts at incorporating silver either in metallic form, or as silver acetate, into the polyamic acid state of the polymer produced from the condensation of pyromellitic dianhydride and 4,4' - diaminodiphenyl ether. Upon thermal aging, the infrared spectra of the untreated film and the film containing finely dispersed silver metal indicate cyclization of the amic acid linkages to imide linkages, whereas the film treated with silver acetate shows only partial imidization. This suggests that silver metal cannot be incorporated into the polyimide backbone but silver in the acetate form can be incorporated into the chain either by reaction with or complexation with the amic acid linkage. Data is presented to differentiate between these two mechanisms. (Author)

AD-757 601 PC$3.00/MF$0.95
Army Materials and Mechanics Research Center Watertown Mass
AN IMPROVED SYNTHESIS OF P-BIS (PHENYLGLOYOXALOYL)-BENZENE.
Technical rept.,
Stanley E. Wentworth. Feb 73, 8p* Rept no. AMMRC-TR-73-5

Descriptors: (*Ketones, Synthesis (Chemistry)), N-heterocyclic compounds, Alkynes, Heat-resistant plastics.
Identifiers: *Glyoxal/phenylene-bis (phenyl-), *Diketones, *Polyquinoxalines, Poly ((biquinoxalinediyl/diphenyl)-phenylene).

An improved synthesis of p-bis (phenylglyoxaloyl)benzene (BPG), one of the co-monomers for the high temperature resistant polyphenylquinoxaline system, has been achieved. The method consists of three simple, high yield steps leading to a 70% overall yield of BPG. The starting material, phenylacetylene, is quantitatively converted to its cuprous salt which is then coupled with p-diiodobenzene to give p-bis (phenylethynyl)benzene in 73% yield. The diacetylene is oxidized to BPG in 96% yield using N-bromosuccinimide in dimethylsulfoxide. (Author)

AD-757 606 Reprint
Frankford Arsenal Philadelphia Pa
CHEMILUMINESCENCE OF LITHIUM PHOSPHIDES.
Technical research article,
Richard A. Strecker, Jonathan L. Snead, and Gilbert P. Sollott. 15 May 72, 9p Rept no. FA-A73-6
Availability: Pub. in Jnl. of the American Chemical Society, v95 n1 p210-214, 10 Jan 73.

Descriptors: (*Phosphines, *Chemiluminescence), Lithium compounds, Synthesis (Chemistry), Spectra (Infrared), Molecular orbitals.
Identifiers: *Phosphine/lithio, Chemical reaction mechanisms.

The chemiluminescence of a series of lithium phosphides, most of which were prepared for the first time has been characterized. Sensitivity of the emissions of the solid salts to change in the organic group, particularly the shift to longer wavelength obtained with the di-alpha-naphthylphosphide relative to phenyl, indicates that the chemiluminescence is of molecular rather than crystal origin. Factors affecting the relationship of phosphide chemiluminescence to molecular structure are discussed. Comparison of chemiluminescence and fluorescence data indicates that electronically excited phosphide molecules are the major emitters. The lithium salts of dicyclohexyl- and diphenylphosphine oxides were discovered to be chemiluminescent, and a structure for these salts in the crystalline state is suggested based on a study of infrared spectra. Mechanistic aspects of the oxidation and chemiluminescence of lithium phosphides are discussed. (Author Modified Abstract)

AD-757 613 PC$3.00/MF$0.95
Edgewood Arsenal Md
STRUCTURE-REACTIVITY RELATIONSHIPS OF SOME BENZYLIDENEMALONOCARBONYLS.
Technical rept. Jun 70-Apr 71,
Pascal A. Tarantino, Marguerite E. Brooks, and Samuel Sass. Mar 73, 19p Rept no. EA-TR-4715

Descriptors: (*Malonic acids, Chemical reactions), (*Thiols, Chemical reactions), Molecular structure, Reaction kinetics, Alkenes.
Identifiers: *Malonic acid/benzylidene, *Pentane dione/benzylidene.

The chemical reactivity of some benzylidenemalonocarbonyls with a nucleophile, 2-diethylaminoethyl mercaptan, is evaluated. Polarographic half-wave potentials (E (1/2)) and chemical rate constants (k1) of 20 compounds are used to establish the correlations. Diethyl benzylidenemalonates, ethyl benzylideneacetoacetates, 3-benzylidene-2,4-pentanediones, and benzylidenemalonamides give linear relationships of E (1/2) and ln k (1). The first three series are linearly intercorrelated while the remaining one is not. The difference could be due to an alteration in the electrode process of the benzylidenemalonamide series. (Author)

COM-73-50227 Not available NTIS
National Bureau of Standards, Washington, D.C.
MUTAROTATION OF SUGARS IN SOLUTION: PART I.
Final rept.,
Ward Pigman, and Horace S. Isbell. 1968, 47p
Grant PHS-AM-04619
Pub. in Advances in Carbohydrate Chemistry, v23 p11-57 1968.

Descriptors: (*Sugars, *Molecular rotation), Chemical equilibrium, Solutions, Reaction kinetics.

The paper is an invited chapter in the annual series 'Advances in Carbohydrate Chemistry.' The principle facts concerning ring changes and the basis for the mutarotation reactions are reviewed; the basic kinetics are developed and the factors affecting the equilibrium of sugars in solution are discussed. Methods for studying mutarotation reactions are described and the authors' early measurements are summarized. (Author)

JPRS-58145 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
SYNTHESIS AND SPECTRAL PROPERTIES OF ORGANOPHOSPHORUS COMPOUNDS CONTAINING A KETO GROUP,
B. N. Laskorin, V. V. Yakshin, and L. I. Sokalskaya. 2 Feb 73, 15p
Trans. of Zhurnal Obshchei Khimii (USSR) v42 n6 p1261-1269 1972.

Descriptors: (*Phosphorus organic acid esters, *Molecular orbitals), Synthesis (Chemistry), Ketones, Ultraviolet spectra, Infrared spectra, Nuclear magnetic resonance, USSR, Translations.

The authors synthesized some organophosphorus compounds, which contain a ketogroup and studied the higher atomic orbitals of phosphorus for the physico-chemical properties of compounds obtained. They observed a dependence of the value of linkage of the carbonyl group with a tetrahedric atom of phosphorus on the overall induction effect of substitutes for phosphorus.

7D. Physical Chemistry

AAEC/TM-622 PC$3.00/MF$0.95
Australian Atomic Energy Commission Research Establishment, Lucas Heights.
CORRELATIONS AND CONVENTIONS FOR THE THERMODYNAMIC PROPERTIES OF AQUEOUS IONS.
R. T. Lowson. Sep 72, 18p
U. S. Sales only

Descriptors: *Water.

For abstract, see NSA 27 06, number 14331.

AD-757 650 PC$3.00/MF$0.95
Stanford Research Inst Menlo Park Calif
EXCITATION AND DEEXCITATION OF VIBRATION IN GASES BY OXYGEN AND NITROGEN ATOMS.
Final rept.,
Graham Black, and Donald J. Eckstrom. 16 Feb 73, 75p
Contract DAHC04-72-C-0015, ARPA Order-1482

Descriptors: (*Nitrogen, Relaxation time), (*Oxygen, Interactions), (*Upper atmosphere, Nitrogen), Molecular energy levels, Vibration, Raman spectroscopy, Atoms, Airglow.
Identifiers: *Collisional energy transfer, Nitrogen atoms, Vibrational energy levels, Raman scattering, Oxygen atoms, Aeronomy, Thermosphere.

The earth's upper atmosphere continuously emits infrared radiation. Some of this radiation is powered by the energy stored in vibrationally excited nitrogen that can be produced by a number of exothermic processes. One of these processes is the reaction NO + N to N2 + O, in which 3.27 eV is available for vibrational and rotational energy of the N2 product as well as for kinetic energy. Once produced, the vibrationally excited nitrogen is deexcited only by collisions. In the E region, one important quenching mechanism is energy transfer to CO2, the rate for which is moderately well known. A second important deexcitation mechanism was considered to be V-T energy exchange with O (triplet P). At the start of this research program, the rate coefficients for this latter process were only known for translational temperatures far higher than are found in the earth's atmosphere. The report discusses the measurement of this rate down to as low a temperature as possible by the use of a shock tube with ozone as the source of atomic oxygen and the infrared-tracer method to monitor the vibrational energy in the nitrogen.

AD-757 677 PC$3.00/MF$0.95
Purdue Univ Lafayette Ind Project Squid Headquarters

QUANTUM DYNAMICAL THEORY OF MOLECULAR COLLISIONS,
Thomas F. George, and John Ross. Feb 73, 83p
Rept no. SQUID-TR-MIT-74-PU
Contract N00014-67-A-0226-0005
Prepared in cooperation with Massachusetts Inst. of Tech., Cambridge and Rochester Univ., N. Y.

Descriptors: (*Molecular beams, Interactions), (*Reaction kinetics, *Molecular orbitals), Potential scattering, Theory, Wave functions.
Identifiers: *Molecular collisions, *Quantum chemistry, Faddeev equations, Symmetry, Squid project.

A review is given of quantum dynamical theory of molecular collisions. The topics include differential and integral equations, mathematical techniques, reduction of the number of coupled equations, Faddeev equations, symmetry effects, and other theories.

AD-757 111 PC$3.00/MF$0.95
Aerodyne Research Inc Burlington Mass
THE MEASUREMENTS OF THE ROTATIONAL RAMAN CROSS SECTION OF N2 AND O2 AT 10.6 MICRONS.
Semiannual rept.,
Morton Camac, and Robert C. Sepucha. Feb 73, 53p Rept no. ARI-RR-22
Contract N00014-73-C-0025, DARPA Order-1806

Descriptors: (*Nitrogen, *Raman spectroscopy), (*Oxygen, Raman spectroscopy), (*Coherent radiation, Attenuation), Rayleigh scattering, Carbon monoxide, Resonance absorption, Light transmission, Atmosphere.
Identifiers: Molecular rotation, Laser beams, *Atmospheric attenuation, Carbon dioxide lasers.

An experimental facility was constructed to measure the rotational Raman scattering cross sections of N2 and O2 at 10.6 microns. The system was designed to measure the Raman cross sections relative to the CO2 radiative absorption cross section in the 10.4-micron band. Static and dynamic calibrations of the system were devised to determine the importance of scattering from walls and dust relative to the Rayleigh and Raman components of the radiation scattered from the gas. (Author)

AD-757 125 Reprint
Queen'S Univ Belfast (Northern Ireland) Dept of Applied Mathematics and Theoretical Physics
EFFECT OF ATOMIC POLARIZABILITY ON LOW-ENERGY FREE-FREE RADIATIVE TRANSITIONS (NOTE),
Howard A. Hyman. 15 Dec 71, 5p
Contract N00014-69-C-0035
Sponsored in part by Advanced Research Projects Agency, Arlington, Va.
Availability: Pub. in Jnl. of Quantitative Spectroscopy and Radiative Transfer, v12 p1253-1256 1972.

Descriptors: (*Atomic energy levels, Polarization), Differential cross section, Electron transitions, Potential energy, Great Britain.
Identifiers: *Quantum chemistry.

The authors show that the free-free cross section must be modified to take account of the induced polarization of the atom. Examples are given to demonstrate the importance of the effect, and, for the case of ions, an approximate formula for the cross section is derived which includes the polarization. (Author Modified Abstract)

AD-757 222 PC$3.00/MF$0.95
Texas A and M Univ College Station Dept of Physics
ATOMIC COLLISION THEORY WITH EMPHASIS ON IONIZATION PHENOMENA.
Final rept. 1 Oct 71-31 Dec 72,
John Nuttall. Feb 73, 12p AFOSR-TR-73-0443
Grant AF-AFOSR-1979-71

Descriptors: (*Gas ionization, Scientific research), Atoms, Scattering, Wave functions.

The report describes research in Atomic Physics carried out by the Atomic Theory Group at Texas A+M University. The work included, work on the three-body problem. The complex energy rotation method and report on numerical calculations, and work with constant impact parameter for the projectile.

AD-757 224 PC$3.00/MF$0.95
Kent State Univ Ohio Liquid Crystal Inst
INTERNATIONAL LIQUID CRYSTAL CONFERENCE (4TH), HELD AT KENT STATE UNIVERSITY, KENT, OHIO, ON 21-25 AUGUST 1972.
Final rept.,
Glenn H. Brown. Feb 73, 108p AFOSR-TR-73-0436
Grant AF-AFOSR-2251-72

Descriptors: (*Symposia, Liquids), Crystal structure.
Identifiers: *Liquid crystals.

The report contains a brief review of the Fourth International Liquid Crystal Conference held at Kent State University. One hundred eighty one papers were on the program and approximately 380 people registered from 16 countries. There were ten plenary lectures. Highlights of the conference are noted as covering reviews of the history of liquid crystals, thermodynamics and flow properties of liquid crystals, electrical effects, crystals, magnetic resonance studies of thermotropic liquid crystals, lyotropic properties, symmetries and polymorphism in the smectic state, liquid crystalline aspects of biological membrane structure, recent advances in preparation of liquid crystals, disinclinations in nematics and cholestrics and properties of the director-vector field, and the problems of polymorphism in liquid crystals. (Author Modified Abstract)

AD-757 230 PC$3.00/MF$0.95
Hebrew Univ Jerusalem (Israel) Racah Inst of Physics
OPTICAL MEASUREMENTS AND MICROWAVE MEASUREMENTS BEHIND SHOCK WAVES.
Final rept. 1 Jul 70-30 Jun 72,
William Low. Nov 72, 54p AFOSR-TR-73-0440
Grant EOOAR-70-0080

Descriptors: (*Shock waves, Reaction kinetics), Diaphragms (Mechanics), Nitrogen, Oxygen, Atoms, Electron density, Israel.

The report presents partial texts of the authors 1971/72 papers. Their titles are: Measurements of diaphragm opening times in shock tubes; Spectroscopic and kinetic studies of N2 - O2 mixtures in shock waves at mach no. 9; Attenuation measurements on narrow shock tubes at mach no. 8 - 11; and Atomic oxygen formation times obtained from measurements of electron density profiles behind shock waves in air. (Author Modified Abstract)

AD-757 288 Reprint
Army Electronics Command Fort Monmouth N J Electronic Components Lab
ADSORPTION OF CADMIUM IONS FROM KOH SOLUTION AT A PLATINUM ELECTRODE,
S. Gilman, and L. D. Sangermano. 17 Aug 71, 5p
Revision of report dated 22 Apr 71.
Availability: Pub. in Jnl. of the Electrochemical Society, v118 n12 p1954-1957 Dec 71.

Descriptors: (*Electrodes, Cadmium), (*Adsorption, *Cadmium), (*Electrochemistry, Electrodes), Platinum, Hydroxides, Solutions.
Identifiers: *Metal air batteries, *Cadmium air cells, *Surface chemistry.

Previously the degradation of the platinum-catalyzed oxygen electrode in an experimental cadmium-air battery cell had been noted, and it was suggested that the effect might be due to the adsorption of cadmium ions. In this study, the degradation effect was verified and an evaluation was made of the nature and extent of the adsorption process responsible for the degradation. (Author Modified Abstract)

AD-757 300 Reprint
Rosenstiel School of Marine and Atmospheric Science Miami Fla
THE EFFECT OF PRESSURE ON THE IONIZATION OF WATER AT VARIOUS TEMPERATURES FROM MOLAL-VOLUME DATA,
Frank J. Millero, Edward V. Hoff, and Larry Kahn. 15 May 72, 20p Rept no. Contrib-1548
Contract Nonr-4008 (02), Grant NSF-GA-17386
Availability: Pub. in Jnl. of Solution Chemistry, v1 n4 p309-327 1972.

Descriptors: (*Water, *Ionization), High-pressure research, Thermodynamics, Density, Volume, Solutions, Sodium chloride, Hydroxides, Hydrochloric acid.

The apparent molal volumes of dilute (0.002 to 1.0 m)aqueous HCl and NaOH solutions have been determined at 0, 25, and 50C and NaCl solutions at 50C. The partial molal volumes (V) of HCl, NaOH, and NaCl solutions have been determined from these apparent molal volumes and other reliable data from the literature. The partial-molal-volume changes for the ionization of water, H2O to H (+) + OH (-), have been determined from 0 to 50C and 0 to 1 m ionic strength from the partial molal volumes of HCl, NaOH, NaCl, and H2O. The partial molal compressibilities (K for HCl, NaOH, NaCl, and H2O have been estimated from data in the literature and used to determine the partial molal compressibility changes for the ionization of water from 0 to 50C and 0 to 1 m ionic strength. The effect of pressure on the ionization constant of water has been estimated from partial-molal-volume and compressibility changes. (Author Modified Abstract)

AD-757 311 Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
DYNAMIC POLARIZATION OF CARBON-13 NUCLEI IN FREE RADICAL SOLUTIONS,
Richard D. Bates, Jr., Burkhard E. Wagner, and Edward H. Poindexter. 30 Aug 72, 4p
Availability: Pub. in Chemical Physics Letters, v17 n3 p328-331, 1 Dec 72.

Descriptors: (*Nuclear magnetic resonance, *Free radicals), Gain, Organic solvents, Molecular orbitals.
Identifiers: Nuclear magnetic resonance (Carbon 13), *Dynamic nuclear polarization.

In contrast to previously studied nuclei, solvent carbon-13 NMR enhancements at 74 G for a series of free radicals show increased contribution of scalar coupling for well shielded, saturated carbons. Enriched (13)CCl4 with BDPA gives an ultimate enhancement of +850. (Author)

AD-757 315 Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
THE KINETICS OF THE P-TOLUQUINHYDRONE ELECTRODE,
F. Kornfeil. 9 May 72, 7p
Presented at the New York Meeting of the Society, 7-9 May 69. Paper no. 248.
Availability: Pub. in Jnl. of the Electrochemical Society, v119 n12 p1674-1679 Dec 72.

Descriptors: (*Quinones, *Electrochemistry), Electrolysis, Polarization, Chemical equilibrium.
Identifiers: *Benzoquinone/methyl, *Hydroquinone, Chemical reaction mechanisms.

The reaction mechanism of the redox system p-toluquinone/toluhydroquinone (toluquinhydrone electrode) on smooth platinum was elucidated with the aid of the electrochemical reaction order method. It was found that in the pH range 0.1-3.2 the reaction proceeds according to the scheme Q+H (+)=HQ (+), HQ (+)+e (-)=HQ, HQ+H (+)=H2Q (+), H2Q (+)+e (-)=HzQ. This mechanism is identical with the HeHe sequence determined by Vetter for the benzoquinone electrode. The relatively fast rate of the charge-transfer steps, however, necessitated measurements of the electrode polarization in the non-steady state. A method is described to determine the individual exchange current densities in moderately fast consecutive charge-transfer reactions. (Author)

AD-757 319 PC$3.00/MF$0.95
Purdue Univ Lafayette Ind Project Squid Headquarters
SPECIE CONCENTRATION AND TEMPERATURE MEASUREMENTS IN FLOW FIELDS.
Technical rept.,
S. Lederman, and J. Bornstein. Oct 72, 58p Rept no. SQUID-TR-PIB-31-PU
Contract N00014-67-A-0226-0005
Prepared in cooperation with Polytechnic Inst. of Brooklyn, Farmingdale, N. Y. (Rept. no. PIBAL-72-30).

Descriptors: (*Raman spectroscopy, Probes (Electromagnetic)), (*Probes (Electromagnetic), *Gas flow), (*Gas analysis, Raman spectroscopy), Temperature, Measurement, Coherent radiation, Numerical analysis, Turbulence, Molecular energy levels, Carbon dioxide, Nitrogen oxides.
Identifiers: Squid project, Laser spectroscopy, Nitrogen oxide (NO), *Temperature measurement.

The Raman scattering technique and its application to the diagnostics of flow fields is discussed, pointing out a number of important positive, as well as negative, features. It is shown experimentally that this technique is capable of providing not only instantaneously and simultaneously point-wise specie concentration in a mixture of polyatomic gases, as well as their temperature in a quiescent mixture of gases, but also in a flow field without the disturbing effects of probes. It is furthermore shown that utilizing the simple, high power pulse technique, the existence of transient fluctuations in the flow field both in terms of specie concentration and temperature can be easily detected. Furthermore, average type of data as obtained using the chromatographic methods can also be obtained without difficulties. (Author)

AD-757 484 PC$3.00/MF$0.95
Massachusetts Univ Amherst Astronomy Research Facility
INFRARED STUDIES OF GASEOUS DISCHARGES.
Final rept. 1 Nov 71-30 Nov 72,
John Strong. 30 Nov 72, 124p Rept no. UMASS-ARF-72-274 AFCRL-72-0739
Contract F19628-72-C-0075, ARPA Order-1366

Descriptors: (*Gas discharges, *Spectra (Infrared)), (*Water vapor, Spectra (Infrared)), (*Hydrogen, Spectra (Infrared)), Excitation, Molecular energy levels, Steam, Resolution, Atoms, Fluorescence.
Identifiers: Hydrogen atoms.

Preparations for study of the chemistry of discharges have been made. Pure water vapor absorption measurements in the 6.3 microns band have been conducted using the Hadamard Transform Spectrometer with resolving power of .07/cm. An investigation of the infrared spectrum of H discharge is described. The emission spectrum of superheated steam (600C) has been studied with the observation of many new hot lines. (Author)

AD-757 504 PC$3.00/MF$0.95
Aerospace Corp El Segundo Calif Lab Operations
TEMPERATURE DEPENDENCE OF SOLUBILITIES OF ELECTROLYTES AND NONELECTROLYTES.
Rept. for Jun-Sep 72,
Nev A. Gokcen, and Elfreda T. Chang. 7 Mar 73, 22p Rept no. TR-0073 (3240-20)-2 SAMSO-TR-73-83
Contract F04701-72-C-0073

Descriptors: (*Gases, Solubility), (*Electrolytes, Solubility), (*Thermodynamics, *Solubility), Solvent action, Temperature, Free energy, Salts.

A critical evaluation of the existing methods of representing the temperature dependence of sparingly soluble electrolytes and nonelectrolytes has been made. A method of much greater accuracy has been formulated and tested with the data on the solubilities of AgCl, AgBr, S8, N2, O2, Ar, and CO2 in liquid solvents. (Author)

AD-757 513 PC$3.00/MF$0.95
Utah Univ Salt Lake City Coll of Engineering
ENHANCEMENT OF ABLATOR PERFORMANCE BY ADDITIVES,
J. D. Chidley, and J. D. Seader. Dec 71, 129p Rept no. UTEC-TH-71-159 AFOSR-TR-72-0022
Contract F44620-68-C-0022

Descriptors: (*Ablation, Additives), (*Rocket motors (Hybrid propellant), Ablation), Phenolic plastics, Silicon dioxide, Chromium compounds, Oxides, Iron, Iron oxides, Electron microscopy, Reinforced plastics, Chemical reactions, Oxidation.
Identifiers: Chromium oxides, Themis project.

The behavior of three additives, Cr2O3, Fe, and Fe2O3, incorporated into the resin phase of a typical phenolic-silica charring-ablative material was investigated. An extensive theoretical basis for the prediction of the relative effects of such additives upon the ablative performance is presented. Char-depth reduction in composites exposed to the relatively low (7.7 cal/sq cm sec) radiant flux of the arc-imaging furnace appeared to be accomplished by two different mechanisms. Char samples from ablatives exposed to the hot-gas environment of a hybrid rocket motor were examined by a scanning electron microscope for evidence as to the mechanism of char-depth reduction by the three additives. Composites containing Cr2O3 exhibited the least reduction in char depth relative to the standard composite. The largest reduction in the char depth, ranging up to thirty percent, was observed in composites containing Fe2O3. It was concluded that under conditions similar to the environment produced by the hybrid-rocket motor, conditions such as might be encountered in ablative rocket motors, the inclusion of Fe or especially Fe2O3 in the ablative composite appears to offer considerable enhancement of ablative-wall performance. (Author Modified Abstract)

AD-757 517 PC$3.00/MF$0.95
Systems Science and Software La Jolla Calif
THE INTERACTION OF SUSPENDED ATMOSPHERIC PARTICLES WITH LASER RADIATION.
Technical rept. 1 Jun 71-31 Jul 72,
J. R. Triplett, and A. A. Boni. Nov 72, 218p Rept no. SSS-R-71-1167 AFWL-TR-72-102
Contract F29601-71-C-0085

Descriptors: (*Gas discharges, Coherent radiation), (*Aerosols, Gas discharges), (*Atmosphere, Light transmission), Vaporization, Gas ionization, Electron density, Excitation, Numerical analysis, Air, Silicon dioxide, Shock waves, Attenuation.
Identifiers: Carbon dioxide lasers, Gas dynamics, Laser heating, *Laser beams, *Atmospheric attenuation, Dielectric breakdown.

The laser flux required to initiate gas breakdown is lowered when the gas contains suspended particles. Initial breakdown in either the vaporized particle or in the shock-heated adjacent gas may result in a laser-supported detonation or in a subsonic ionization wave. The nonlinear, nonequilibrium kinetic equations describing the energy distribution of free electrons, the vibrational excitation of molecules, the dominant electronic excitation, attachment, and ionization reactions and their inverses, electron heating by the laser, and electron diffusion, are solved numerically. The dominant eigenvalue of the Jacobian of these equations is investigated as a criterion for breakdown. Calculations for vaporized silica and air at temperatures from 300K to 6000K under irradiation by a CO2 laser show expected lowering of breakdown threshold for preheated material. Heating of particle vapor and subsequent formation of a shock wave are calculated with a Lagrangian gasdynamic method. Preliminary theoretical predictions for the effects of particles on lowering of the air breakdown threshold are then obtained. (Abstract Modified Abstract)

AD-757 518 PC$6.00/MF$0.95
National Bureau of Standards Washington D C
THE THERMODYNAMICS OF CHEMICAL SPECIES IMPORTANT IN AEROSPACE TECHNOLOGY (INCLUDING SPECIAL TOPICS IN CHEMICAL KINETICS).
Interim rept.,
Thomas B. Douglas, and Charles W. Beckett. 1 Jul 72, 319p Rept no. NBS-10904 AFOSR-TR-72-2004
See also report dated 1 Jul 71, AD-736 039.

Descriptors: (*Thermochemistry, Scientific research), Calorimetry, Vapor pressure, Molybdenum compounds, Fluorides, Carbides, Specific heat, Tantalum alloys, Niobium alloys, Tungsten alloys, Heat of fusion, Reaction kinetics, Ammonia, Hydrazine, Bibliographies, Tables.
Identifiers: Molybdenum fluoride (MoF6), Molybdenum fluoride (MoF5), Molybdenum carbides.

Contents: The heat of formation of MoF6 (l) by solution calorimetry; Molybdenum pentafluoride-vaporization properties from transpiration; The vibrational spectra of molybdenum pentafluoride; The measurement of the relative enthalpy of Mo2C from 273.15 to 1475 K; High-speed (subsecond) simultaneous measurement of specific heat, electrical resistivity, and hemispherical total emittance of tantalum-10 (WT. %) tungsten alloy in the range 1500 to 3200 K; Simultaneous measurement of specific heat, electrical resistivity, and hemispherical total emittance of niobium-1 (WT. %) zirconium alloy in the range 1500 to 2700 K; Measurement of melting point and electrical resistivity (above 3600 K) of tungsten by a pulse heating method; Measurement of melting point, Normal spectral emittance (at melting point), and electrical resistivity (above 2650 K) of niobium; A pulse heating technique for the measurement of heat of fusion of metals; Rate constants for the reactions- (M)+NH3 = NH2 (radical)+H (radical) + (M), (M)+ N2H4=2NH2 (radical) + (M), and (M) + N2F4=2NF2 (radical) + (M); Chemical kinetics of reactions of chlorine, nitrogen and oxygen fluorides in gas phase - a bibliography - 1934 through June 1972; and New ideal-gas thermochemical tables.

AD-757 528 PC$3.00/MF$0.95
Purdue Univ Lafayette Ind Thermophysical Properties Research Center
TRANSPORT PROPERTIES OF SELECTED ELEMENTS AND COMPOUNDS IN THE GASEOUS STATE,
Peter E. Liley. Nov 72, 77p Rept no. TPRC-20 AFOSR-TR-73-0478
Grant AF-AFOSR-2396-72

Descriptors: (*Gases, Transport properties), Tables, Mixtures, Viscosity, Thermal conductivity, Diffusion, Helium, Hydrogen, Deuterium, Ammonia, Fluorine, Nitrogen compounds, Fluorides.
Identifiers: *Thermophysical properties, Gaseous diffusion, Hydrogen atoms, Nitrogen fluoride

(NF3), Hydrogen fluoride, Lennard-Jones potential.

Tables of viscosity, thermal conductivity and diffusion coefficient have been prepared for thirty-eight binary mixtures and for nine pure substances, the latter comprising helium, atomic and molecular hydrogen, atomic and molecular deuterium, atomic and molecular fluorine, hydrogen fluoride and deuterium fluoride. Most of the binary mixtures are combinations of these substances. The temperature range was from 100 to 3000K. For the pure substances, the most recent recommendations were used and for the mixtures, the Lennard-Jones 6-12 potential was used for viscosity and diffusion, and a linear mixing rule was employed for thermal conductivity. The precision of the tabulated values is reviewed. The present state-of-the-art in predicting these properties is briefly surveyed. It is concluded that significant discrepancies can still exist between theoretical and experimental quantities. (Author)

AD-757 579 Reprint
National Research Council Washington D C
THE CORRELATION ENERGY OF ATOMIC FLUORINE,
D. F. Scofield, N. C. Dutta, and D. M. Dutta. 1972, 10p ARL-73-0067
Contract F18600-70-C-0006
Availability: Pub. in International Jnl., of Quantum Chemistry, n6 p9-17 1972.

Descriptors: (*Fluorine, *Atomic orbitals), Perturbation theory, Potential energy.
Identifiers: Fluorine atoms, *Quantum chemistry.

The linked-cluster many-body perturbation theory of Brueckner and Goldstone has been applied to calculate the correlation energy of atomic fluorine in its doublet P ground state. Approximate results using complete orthonormal HFV (N-1), HFV (N)OAO and HFSV (N-1) basis sets are reported. A discussion of various basis sets and a comparison between these three is given. The correlation energies computed including only the second-order pair-correlation, hole-hole corrections and the third-order ring diagrams plus three basis sets - .3039 a.u. - .3230 a.u., and - .3370 a.u., respectively. A discussion of the pair-correlation energies of oxygen, fluorine, and neon is also given. (Author)

AD-757 607 PC$3.00/MF$0.95
Picatinny Arsenal Dover N J
A RUBY LASER NANOSECOND FLASH PHOTOLYSIS SYSTEM. I. 1,4--DINITRONAPHTHALENE.
Technical rept.
Feb 73, 27p Rept no. PA-TR-4445

Descriptors: (*Photolysis, *Naphthalenes), (*Explosive materials, Photolysis), Excitation, Lasers, Electron transitions, Relaxation time.
Identifiers: *Nitro compounds, *Naphthalene/dinitro, *Flash photolysis, Ruby lasers.

The report describes a ruby laser nanosecond flash photolysis system which was set up in the Explosives Division, Feltman Research Laboratory, Picatinny Arsenal to study the chemical reactivity of electronically excited states of aromatic nitrocompounds. The system is capable of recording absorption spectra of transient species with half-lives in the range of 20 nanoseconds to 1 millisecond. Kinetic data pertaining to the lifetime of electronically excited states can be recorded by following the transient absorption as a function of time. Preliminary data on the spectroscopic and kinetic behavior of 1,4-dinitronaphthalene triplet excited state were obtained with the equipment described in the report. (Author)

AD-757 656 PC$5.45/MF$0.95
Naval Research Lab Washington D C
PHOTONUCLEAR ACTIVATION ANALYSIS WITH GE (LI) DETECTORS: A COMPILATION.
Interim rept.,
M. Elaine Toms. 20 Feb 73, 123p* Rept no. NRL-7554

Descriptors: (*Radioactivation analysis, *Bremsstrahlung), (*Gamma ray spectroscopy, Radioactivation analysis), Nuclear radiation spectrometers, Tables, Photonuclear reactions, Half life.
Identifiers: *Photonuclear activation analysis, Germanium (Li) detectors, Solid state counters.

High-energy bremsstrahlung, variable up to about 60 MeV, from high-intensity electron linacs can produce activation through a variety of photonuclear reactions. A great range of activities by half-lives can be used. Some discrimination between target elements can be obtained through the choice of bremsstrahlung endpoint energy. The high discrimination of Ge (Li) gamma-ray spectrometers permits much of the analysis to be accomplished without chemical separation of resulting nuclei; hence nondestructive analysis can be applied to many materials. To facilitate the use of such analysis, a compilation of photonuclear reactions with their resulting gamma-rays has been prepared, consisting of two tables. Table 1 lists the photonuclear reactions by target nuclei, giving the residual nuclei for half-lives from 100 micro sec to 24 hours. Table 2, derived from Table 1, is a list of gamma-ray energies by reactions designed to identify unknown target nuclei. (Author)

AD-757 671 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
THE EFFECTIVE CROSS SECTION FOR THE PRODUCTION OF THE C TRIPLET PI (U) STATE OF N2 WHEN BOMBARDED BY LOW ENERGY ELECTRONS.
Master's thesis,
James Louis Poole. Dec 72, 29p

Descriptors: (*Nitrogen, *Electron bombardment), Excitation, Differential cross section, Molecular energy levels, Band spectrum, Theory, Theses.

The paper describes a system and its calibration for measuring the effective cross section for the production of the C triplet Pi (u) state of N2 in the lowest vibrational level under bombardment by electrons in the 150 eV to 1.2 KeV energy range and the measurements which were made. With a gas pressure of about 0.03 torr, the effective cross section of the second positive system of N2 under bombardment by 150 eV electrons was found. The value is believed to be very near the peak value of the cross section. (Author Modified Abstract)

AD-757 721 PC$3.00/MF$0.95
Joint Inst for Lab Astrophysics Boulder Colo
ADVANCED INTERDISCIPLINARY RESEARCH IN THE DEFENSE APPLICATIONS OF LABORATORY ASTROPHYSICS.
Semiannual technical status rept. Aug 72-31 Jan 73,
A. V. Phelps, and S. J. Smith. Feb 73, 38p AROD-10827:5-P
Contracts DAHC04-72-C-0047, DA-31-124-ARO (D)-139
See also report dated Sep 72, AD-751 492.

Descriptors: (*Gas ionization, Scientific research), (*Potential scattering, Gases), (*Plasma medium, Scientific research), Gas discharges, Electron density, Diffusion, Dissociation, Atoms, Atomic energy levels.
Identifiers: *Collisional energy transfer, Electron scattering, Atom electron interactions, Line broadening.

The report summarizes research on the following: Modeling of ionized gas systems; Stability of discharges in weakly ionized gases; Scattering and transport of resonance radiation; Radiation hydrodynamics; Plasma statistics; Transport coefficients and reaction rates; Electron transport and ionization coefficients; JILA information analysis center; Electron transport in mercury vapor; Negative ion kinetics; Atomic and radiation interaction theory; and Alkali-inert gas line broadening and intermolecular potentials.

AEEW-R-809 PC$3.00/MF$0.95
Atomic Energy Establishment, Winfrith (England).
DIFFUSION CONTROLLED ELECTROCHEMICAL MASS TRANSFER MODELLING TECHNIQUE FOR HEAT TRANSFER STUDIES.
N. V. Mackley. Oct 72, 14p
U. S. Sales only

Descriptors: *Heat exchangers, *Heat transfer.

For abstract, see NSA 27 06, number 14340.

AERE-R-6724 PC$3.00/MF$0.95
Atomic Energy Research Establishment, Harwell (England).
STUDIES OF THE ANALYSIS OF AIRBORNE PARTICULATE MATERIAL BY RADIOACTIVATION AND SODIUM IODIDE SPECTROMETRY.
D. H. F. Atkins, E. M. R. Fisher, and L. Salmon. Oct 72, 25p
U. S. Sales only

Descriptors: *Air, *Aluminum, *Antimony, *Barium, *Bromine, *Calcium, *Chlorine, *Copper, *Iodine, *Magnesium, *Manganese, *Nickel, *Potassium, *Sodium, *Vanadium.

For abstract, see NSA 27 06, number 11649.

CEA-CONF-2122 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Saclay (France). Centre D'Etudes Nucleaires.
NEUTRON ACTIVATION ANALYSIS OF SOLID ATMOSPHERIC POLLUTANTS WITH AN INTERNAL STANDARD TECHNIQUE.
Y. Belot, and T. Marini. 1971, 14p CONF-721010-14
Lang- In French. From International Conference On Modern Trends In Activation Analysis-Saclay, France (2 Oct 1972). U. S. Sales only

Descriptors: *Air.

For abstract, see NSA 27 06, number 11652.

CEA-R-4333 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Saclay (France). Centre D'Etudes Nucleaires.
STUDY OF CONCENTRATED METAL-AMMONIA SOLUTIONS- MAGNETIC PROPERTIES AND NON METAL-METAL TRANSITION.
J. P. Lelieur. Sep 72, 142p
Lang- In French. Thesis Submitted To Paris Univ., Orsay (france). U. S. Sales only

Descriptors: *Ammonia, *Cesium alloys and systems, *Sodium alloys and systems.

For abstract, see NSA 27 06, number 11741.

CEA-R-4377 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Bruyeres-Le-Chatel (France). Centre D'Etudes.
USE OF ANALOGUE DIGITAL INTEGRATORS IN GASEOUS PHASE CHROMATOGRAPHY.
Roger Schott. Nov 72, 36p
Lang- In French. U. S. Sales only

Descriptors: *Gas chromatography, *Pulse converters.

For abstract, see NSA 27 06, number 14360.

CEA-R-4392 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Fontenay-Aux-Roses (France). Centre D'Etudes Nucleaires.
ELECTROCHEMICAL STUDY OF THE PROPERTIES OF MAGNESIUM CHLORIDE IN MOLTEN LICL AND KCL AND IN THE LICL-KCL EUTECTIC.
Sylvain Le Vaguerese. Nov 72, 67p
Lang- In French. U. S. Sales only

Descriptors: *Lithium chlorides, *Magnesium chlorides, *Potassium chlorides.

For abstract, see NSA 27 06, number 11743.

COM-73-50229 Not available NTIS
National Bureau of Standards, Washington, D.C.
THE SOLID PLUS VAPOR AND LIQUID PLUS VAPOR PHASE EQUILIBRIUM PROPERTIES OF NEON PLUS KRYPTON.
Final rept.,
R. C. Miller, A. J. Kidnay, and M. J. Hiza. 1972, 12p
Pub. in J. Chem. Thermodyn., v4 n6 p807-818 Nov 72.

Descriptors: (*Phase transformations, *Rare gases), Neon, Krypton, Mixtures, Melting.

A vapor-recirculation equilibrium cell was used to investigate the solid + vapor and liquid + vapor equilibria and the three-phase curve (equilibrium between solid, liquid, and vapor) for neon and krypton. Gas phase compositions were measured above solid krypton at 100.00, 110.00, amd 115.00 K and at pressures to 95 atm (9.6 MPa). Both gas and liquid phase compositions were determined at 120.00, 130.00, 140.00, and 150.00 K at pressures to 106 atm (10.7 MPa). Comparison of cross second virial coefficients from the experimental gas phase results with values obtained from a corresponding states correlation indicate that a deviation parameter from the geometric mean mixing rule for energy parameters of approximately 0.23 is necessary to reconcile the experimental and predicted virial coefficients. Analysis of the Henry's law constants obtained from the liquid phase is also given. (Author Modified Abstract)

COM-73-50231 Not available NTIS
National Bureau of Standards, Washington, D.C.
ANALYSIS OF THE TRANSPORT COEFFICIENTS FOR SIMPLE DENSE FLUIDS: APPLICATION OF THE MODIFIED ENSKOG THEORY.
Final rept.,
H. J. M. Hanley, R. D. McCarty, and E. G. D. Cohen. 1972, 35p
Pub. in Physics, v60 n2 p322-356 Aug 72.

Descriptors: (*Liquids, *Transport properties), Theories, Viscosity, Thermal conductivity, Argon, Oxygen, Hydrogen, Liquefied gases, Density (Mass/volume).
Identifiers: *Enskog theory.

The viscosity and thermal-conductivity coefficients for argon, oxygen, and p-hydrogen have been calculated from the modified Enskog theory (i.e., the hardsphere Enskog theory adapted to include experimental PVT data) and compared with experiment over a wide range of experimental conditions. Specifically, experimental data and theoretical predictions for the first density corrections and were examined and the temperature and density dependences of the experimental and theoretical transport coefficients in the liquid were studied. A brief comparison of the modified Enskog theory with some other theories is included. The qualitative features of the theory are discussed in some detail leading to a method by which the predictive capability of the theory can be improved. (Author Modified Abstract)

COM-73-50232 Not available NTIS
National Bureau of Standards, Washington, D.C.
EXPERIMENTAL EVIDENCE FOR STATISTICAL RANDOMIZATION OF HYDROGEN ATOMS IN THE ETHYL CATION.
Final rept.,
P. Ausloos, R. E. Rebbert, L. W. Sieck, and T. O. Tiernan. 1972, 3p
Pub. in Jnl. of the American Chemical Society, v94 n25 p8939-8941 1972.

Descriptors: (*Organic ions, Molecular isomerism), Mass spectroscopy, Deuterium compounds.

It is shown that the hydrogen atoms in the ethyl cations formed in the unimolecular decomposition of CD3CH2I (+), CH3CD2I (+), CD3CH2Br (+), CD3CH2CD3 (+), CH3CD2CH3 (+) and CD3CH2CH2CD3 are scrambled statistically at reactant gas pressures ranging from 0.00001 to 1000 torr. Photon absorption (11.6-11.8 eV), electron impact and 60Co-gamma radiation have been used in the production of the ethyl cations. Two experimental approaches, kinetic mass spectrometry and chamical end product analysis, have been applied to this problem. The energy barrier for the 1,2 hydride shift in the ethyl cation is given. (Author)

COO-1140-205 PC$3.00/MF$0.95
Kansas Univ., Lawrence. Dept. Of Chemistry.
HIGH TEMPERATURE CHEMISTRY. PROGRESS REPORT, NOVEMBER 1, 1971-OCTOBER 31, 1972.
P. W. Gilles. 1972, 21p
Contract AT (11-1)-1140

Descriptors: *Copper chlorides, *Oxygen systems, *Titanium oxides, *Tungsten alloys and systems, *Vanadium alloys and systems, *Vaporization.

For abstract, see NSA 27 06, number 11745.

COO-2190-4 PC$3.00/MF$0.95
Utah Univ., Salt Lake City. Dept. Of Chemistry.
CALCULATION OF PRODUCT YIELDS IN T + H/SUB 2/ AND T + D/SUB 2/ SYSTEMS.
C. J. Malerich, and Leonard Spicer. 10p
CONF-720821-5
Contract AT (11-1)-2190
From 164. National American Chemical Society Meeting- New York, Ny (27 Aug 1972).

Descriptors: *Deuterium, *Hydrogen, *Tritium.

For abstract, see NSA 27 06, number 11844.

HEDL-SA-426 PC$3.00/MF$0.95
Hanford Engineering Development Lab., Richland, Wash.
SYNOPSIS OF ORAL PRESENTATION ANALYTICAL CHEMISTRY PROGRAMS AT THE HANFORD ENGINEERING DEVELOPMENT LABORATORY.
G. J. Alkire, L. A. Hartcorn, W. Y. Matsumoto, and R. L. Moore. 13 Sep 72, 32p CONF-721025-13
Contract AT (45-1)-2170
From 16. Conference On Analytical Chemistry In Nuclear Technology- Gatlinburg, Tn (24 Oct 1972).

Descriptors: *Analytical chemistry, *Fast flux test facility.

For abstract, see NSA 27 06, number 11644.

IS-T-559 PC$3.00/MF$0.95
Ames Lab., Iowa.
CRYSTAL STRUCTURES OF HEXAMMINECOBALT HEXACHLOROANTIMONATE (III) AND HEXAMMINECOBALT NONAFLUOROANTIMONATE (III).
D. R. Schroeder. Dec 72, 37p
Contract W-7405-ENG-82
Thesis.

Descriptors: *Cobalt.

For abstract, see NSA 27 06, number 14386.

IS-T-560 PC$3.00/MF$0.95
Ames Lab., Iowa.
CRYSTAL STRUCTURES OF COMPOUNDS POTENTIALLY RELATED TO THE BISHOMOTROPYLIUM ION.
L. K. Read. Nov 72, 53p
Contract W-7405-ENG-82
Thesis.

Descriptors: *Cycloalkenes.

For abstract, see NSA 27 06, number 14387.

IS-T-570 PC$3.00/MF$0.95
Ames Lab., Iowa.
APPLICATIONS OF X-RAY DIFFRACTION TO ORGANIC REACTION MECHANISMS.
C. M. Lee. Nov 72, 85p
Contract W-7405-ENG-82
Thesis.

Descriptors: *Chemical reactions.

For abstract, see NSA 27 06, number 14388.

KFKI-72-57 PC$3.00/MF$0.95
Magyar Tudomanyos Akademia Kozponti Fizikai Kutato Intezete, Budapest.
INFLUENCE OF INDUCED RESONANCE TRANSITIONS ON THE PROBABILITY OF MULTIPHOTON IONIZATION OF AN ATOM.
I. Sh. Bakosh, V. D. Ovsyannikov, and L. P. Rapoport. 1972, 12p
Lang- In Russian. U. S. Sales only

Descriptors: *Atoms.

For abstract, see NSA 27 06, number 14397.

KFKI-72-58 PC$3.00/MF$0.95
Magyar Tudomanyos Akademia Kozponti Fizikai Kutato Intezete, Budapest.
PI-ELECTRON SCF-MO CALCULATIONS FOR DISUBSTITUTED BENZENE DERIVATIVES CONTAINING TWO DONOR GROUPS. PART II. NUMERICAL RESULTS OF CALCULATIONS.
A. I. Kiss, and J. Szoke. 1972, 21p
U. S. Sales only

Descriptors: *Benzene.

For abstract, see NSA 27 06, number 14398.

LA-DC-72-1404 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
FORMATION OF CARBIDE DISPERSIONS IN CARBONS USING ORGANOMETALLIC ADDITIONS.
R. J. Imprescia, E. M. Wewerka, R. D. Reiswig, and L. S. Levinson. 10p CONF-721054-1
From Symposium On Special Carbons- Albuquerque, Nm. (25 Oct 1972).

Descriptors: *Bituminous materials, *Carbon, *Furfuryl alcohol, *Organic compounds/ metallo-.

For abstract, see NSA 27 06, number 12571.

LBL-1312 PC$3.00/MF$0.95
California Univ., Berkeley. Lawrence Berkeley Lab.
NEW TECHNOLOGIES.
D. A. Mack. Oct 72, 57p CONF-721057-1
Contract W-7405-ENG-48
From Business And Environment Seminar- Disneyland, Fl (16 Oct 1972).

Descriptors: *Instruments, *Microwave spectroscopy, *Nuclear magnetic resonance, *X-ray fluorescence analysis.

For abstract, see NSA 27 06, number 12216.

NP-19621 PC$3.00/MF$0.95
Bergen Univ. (Norway). Dept. Of Physics.
ATOMIC COULOMB EXCITATIONS BY HEAVY, CHARGED PARTICLES. REPORT NO. 39.
J. M. Hansteen, and O. P. Mosebekk. Dec 71, 46p
U. S. Sales only

Descriptors: *Atoms, *Ions.

For abstract, see NSA 27 06, number 12992.

N73-16106 Not Available - NTIS
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
METHOD OF DETECTING OXYGEN IN A GAS. Patent
H. D. Hendricks. 9 Jan 73, 5p
NASA-CASE-LAR-10668-1, US-PATENT-3,709,663US-PATENT-APPL-SN-172459US-PATENT-CLAS S-23-232RUS-PATENT-CLASS-23-23 2EUS-PATENT-CLASS-23-254RUS-P ATENT-CLASS-23-254EUS-PATENT-C LASS-250-71RUS-PATENT-CLASS-250-83.3UV Misc 0filed 17 Aug. 1971 Supersedes N72-21103 (10-12, P 1567)
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

For abstract, see STAR 11 07.

N73-16108 PC$12.50/MF$0.95
Institut Daeronomie Spatiale de Belgique, Brussels.
MOLECULAR OXYGEN ABSORPTION IN THE SCHUMANN-RUNGE BANDS . ABSORPTION PAR LOXYGENE MOLECULAIRE DANS LES BANDES DE SCHUMMANN-RUNGE.
G. Kockarts. 1972, 208p A-N-107-1972
Language French English Summary

Descriptors: *Absorption cross sections, *Oxygen, *Schumann-runge bands, *Tables (data), Molecular gases, Temperature distribution, Wavelengths.

For abstract, see STAR 11 07.

N73-16109 PC$3.00/MF$0.95
Linguistic Systems, Inc., Cambridge, Mass.
A METHOD OF ANALYSING THE MIXTURE OF HYDROGEN, METHANE, AND ETHANE.
E. M. Mulders, and F. E. Scheffer. Jan 73, 14p
NASA-TT-F-14681
Contract NASW-2482
Tran- Transl. Into English From Rec. Trav. Chim. (Netherlands), V. 49, 1930 P 1057-1065

Descriptors: *Condensing, *Fractionation, *Gas mixtures, *Volumetric analysis, Ethane, Gas analysis, Hydrogen, Methane, Partial pressure.

For abstract, see STAR 11 07.

N73-16113 PC$3.25/MF$0.95
Kanner (Leo)Associates, Redwood City, Calif.
PARAMETERS FOR OXIDATION RATE OF ORGANIC SUBSTANCES IN LOW-TEMPERATURE OXYGEN PLASMA.
K. Hozumi, and M. Matsumoto. Feb 73, 25p
NASA-TT-F-14671
Contract NASW-2481
Tran- Transl. Into English From Bunseki Kagaku (Tokyo), V. 21, 1972 P 206-214

Descriptors: *High frequencies, *Low temperature, *Organic liquids, *Oxidation, *Plasmas (physics), Correlation, Electric fields, Electron energy, Flow velocity.

For abstract, see STAR 11 07.

N73-16114 PC$3.25/MF$0.95
Interuniversitair Reactor Instituut, Delft (Netherlands).
AUTOMATED CHEMICAL SEPARATIONS IN ROUTINE ACTIVATION ANALYSIS.
P. S. Tjioe, J. J. Degoeij, and J. P. Houtman. 1972, 23p IRI-133-72-10
Conf- Presented At the 4th Intern. Conf. on Modern Trends in Activation Analysis, Saclay, France, 2-6 Oct. 1972

Descriptors: *Automatic test equipment, *Distillation, *Ion exchanging, *Neutron activation analysis, *Trace elements, Antimony, Arsenic, Cadmium, Copper, Mercury (metal), Selenium, Zinc.

For abstract, see STAR 11 07.

N73-16585 PC$4.50/MF$0.95
Fraunhofer-gesellschaft Zur Forderung Der Angewandten Forschung E. V., Grafschaft (West Germany). Inst. Fuer Aerobiologie.
AERODYNAMIC DIAMETER OF LATEX AGGREGATES AND ASBESTOS FIBERS . DER AERODYNAMISCHE DURCHMESSER VON LATEXAGGREGATEN UND ASBESTFASERN.
W. Stoeber, and D. Hochrainer. 1972, 47p
BMVG-FBWT-72-10
Subm- Sponsored By Bundesmin. Fuer Verteidigung

Descriptors: *Asbestos, *Centrifuges, *Latex, *Particle size distribution, Aerosols, Fibers, Molecular chains, Spheres.

For abstract, see STAR 11 07.

N73-16676 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
DISSOCIATION RATE OF BROMINE DIATOMICS IN AN ARGON HEAT BATH.
R. Razner, and D. Hopkins. Jan 73, 122p
NASA-TN-D-7077, E-6902

Descriptors: *Argon, *Bromine, *Dissociation, Diatomic molecules, Energy transfer, Mathematical models, Molecular collisions, Molecular relaxation, Shock tubes.

For abstract, see STAR 11 07.

N73-16925 PC$3.00/MF$0.95
Linguistic Systems, Inc., Cambridge, Mass.
THERMODYNAMICS OF THE PYROLYSIS OF HYDROCARBONS IN A NITROGEN PLASMA.
S. N. Ganz, and Y. Krasnokutskiy. Jan 73, 14p
NASA-TT-F-14685
Contract NASW-2482
Tran- Transl. Into English From Khim. Tekhnol. (USSR, No. 19, 1971 P 18-24

Descriptors: *Hydrocarbons, *Hydrogen cyanides, *Nitrogen plasma, *Pyrolysis, High temperature, Pressure gradients, Temperature effects, Temperature gradients.

For abstract, see STAR 11 07.

ORNL-TM-4056 PC$3.00/MF$0.95
Oak Ridge National Lab., Tenn.
EQUILIBRIUM OF DILUTE UF/SUB 3/ SOLUTIONS CONTAINED IN GRAPHITE.
L. M. Toth, and L. O. Gilpatrick. Dec 72, 35p
Contract W-7405-ENG-26

Descriptors: *Graphite, *Uranium fluorides ufs, *Uranium fluorides uft.

For abstract, see NSA 27 06, number 11852.

ORO-3922-5 PC$3.00/MF$0.95
Texas Agricultural And Mechanical Univ., College Station.
RESEARCH IN CHARGED PARTICLE ACTIVATION ANALYSIS. FINAL REPORT, FEBRUARY 1, 1971-JULY 31, 1972.
E. A. Schweikert. 1972, 12p
Contract AT (40-1)-3922

Descriptors: *Carbon, *Sulfur.

For abstract, see NSA 27 06, number 11656.

PB-215 899/6 PC$3.00/MF$0.95
California Univ., Berkeley. Dept. of Geology and Geophysics.
SOLMNEQ: SOLUTION-MINERAL EQUILIBRIUM COMPUTATIONS.
Final rept.,
Yousif K. Kharaka, and Ivan Barnes. Feb 73, 81p* USGS/WRD-73-002
Contract DI-14-08-0001

Descriptors: (*Water chemistry, Chemical equilibrium), (*Chemical equilibrium, *Computer programs), (*Minerals, Water chemistry), Activity coefficients, Thermodynamics, Oxidation-reduction reactions, Gibbs free energy, PL/1 programming language.
Identifiers: SOMNEQ computer program, IBM 360 computers.

SOLMNEQ is a computer program written in PL/I for the IBM 360 computers. SOLMNEQ computes the equilibrium distribution of 162 inorganic aqueous species generally present in natural waters over the temperature range of 0 to 350C from the reported chemical analyses, temperature, pH, and Eh (optional). Interpolated dissociation constants of the aqueous complexes and the computed activity coefficients are also used in these computations. States of reactions of the aqueous solutions with respect to 158 solid phases (minerals) are computed from the distribution of aqueous species and an internally consistent set of thermodynamic data. Ionic proportions and subsurface temperature estimates are computed. (Author)

PB-216 803/7 PC$3.00/MF$0.95
Michigan State Univ., East Lansing. Inst. of Water Research.
DEVELOPMENT OF AN INSTRUMENTAL COMBUSTION METHOD FOR THE RAPID DETERMINATION OF TOTAL PHOSPHORUS IN AQUEOUS SOLUTIONS.
Completion rept. 1 Jun 69-30 Jun 70,
Frank M. D'Itri. Jan 73, 74p* W73-06020, OWRR-A-033-MICH (1)
Contract DI-14-31-0001-3022

Descriptors: (*Water analysis, *Phosphorus), (*Gas chromatography, *Phosphines), Reduction (Chemistry), Gas chromatography, Combustion, Laboratory equipment.
Identifiers: *Water pollution detection.

An instrumental combustion method was designed for the rapid determination of milligram quantities of phosphorus in aqueous solutions. With this technique both inorganic and organic phosphorus compounds are reduced to phosphine in an hydrogen atmosphere at 920 C. The phosphine is separated from other combustion products on a chromatographic column and measured by a cesium thermionic detector with the signal transmitted to a potentiometric recorder. The method requires microliter samples and the minimum detectability of the system is in the range of 0.1 to 0.2 micrograms (approximately equivalent to 100 to 200 milligrams per liter) as phosphorus. The analysis time per sample is less than 10 minutes. (Author)

RFP-TRANS-125 PC$3.00/MF$0.95
REACTIVE EVAPORATION IN IONIZED GASES.
Walter. Heitmann. 23p

Descriptors: *Films, *Silicon oxides, *Silicon oxynitrides, *Titanium oxides.

For abstract, see NSA 27 06, number 14421.

RFP-1974 PC$3.00/MF$0.95
Dow Chemical U.s.a., Golden, Colo. Rocky Flats Div.
QUANTITATIVE DETERMINATION OF MOISTURE BY THE COLD-TRAP METHOD.
R. S. Cichorz. 26 Dec 72, 12p
Contract AT (29-1)-1106

Descriptors: *Water.

For abstract, see NSA 27 06, number 14417.

SGAE-2033 PC$3.00/MF$0.95
Oesterreichische Studiengesellschaft Fuer Atomenergie G.m.b.h., Seibersdorf. Physik-Institut.
COMPARISON BETWEEN QUADRUPOLE AND MAGNETIC MASS SPECTROMETERS FOR USE IN SIM.
F. G. Ruedenauer. Sep 72, 16p CONF-720716-2
From International Conference And Exhibition On Vacuum Instruments And Methods In Surface Studies- Guildford, Surrey, Uk (10 Jul 1972). U. S. Sales only

Descriptors: *Mass spectrometers.

For abstract, see NSA 27 06, number 14434.

SRO-645-2 PC$3.00/MF$0.95
Georgia Unit., Athens. Dept. Of Chemistry.
PHOTOELECTRON SPECTROSCOPY. FINAL REPORT, APRIL 1, 1970-SEPTEMBER 30, 1972.
D. M. Hercules. 5 Jan 73, 6p
Contract AT (38-1)-645

Descriptors: *Organic compounds.

For abstract, see NSA 27 06, number 14437.

UCB-34-P-32-PR-7 PC$3.00/MF$0.95
California Univ., Berkeley. Dept. Of Physics.
MASS SPECTROSCOPY RESEARCH. PROGRESS REPORT.
15 Sep 72, 18p
Contract AT (04-3)-34

Descriptors: *Meteorites, *Neutrons/ fast, *Tellurium.

For abstract, see NSA 27 06, number 12695.

7E. Radio and Radiation Chemistry

BMBW-FBK-72-15 PC$3.00/MF$0.95
Mainz Univ. (West Germany). Institut Fuer Anorganische Chemie Und Kernchemie.
ANNUAL REPORT, 1971.
Aug 72, 163p
Lang- In German. U. S. Sales only

Descriptors: *Nuclear chemistry, *Inorganic chemistry.

For abstract, see NSA 27 06, number 13483.

COO-2190-3 PC$3.00/MF$0.95
Utah Univ., Salt Lake City. Dept. Of Chemistry.
GAS PHASE REACTIONS OF NUCLEAR RECOIL PRODUCED SULFUR ATOMS WITH SIMPLE HYDROCARBONS, HYDROGEN, AND OXYGEN.
Larry Kremer, and Leonard Spicer. 9p
CONF-720821-4
Contract AT (11-1)-2190
From 164. National American Chemical Society Meeting- New York, Ny (27 Aug 1972).

Descriptors: *Hydrocarbons, *Hydrogen, *Oxygen, *Sulfur isotopes s- 5.

For abstract, see NSA 27 06, number 11843.

COO-2190-5 PC$3.00/MF$0.95
Utah Univ., Salt Lake City. Dept. Of Chemistry.
COLLISION DENSITY IN RECOIL HOT ATOM SYSTEMS. EFFECT OF REACTIVE EVENTS.
C. J. Malerich, and L. D. Spicer. 10p
CONF-720821-6
Contract AT (11-1)-2190
From 164. National American Chemical Society Meeting- New York, Ny (27 Aug 1972).

Descriptors: *Hydrogen, *Tritium.

For abstract, see NSA 27 06, number 11845.

COO-2190-6 PC$3.00/MF$0.95
Utah Univ., Salt Lake City.
DYNAMICS AND MECHANISMS OF HOT CHEMISTRY STIMULATED BY RECOIL METHODS. PROGRESS REPORT, MARCH 1, 1972-FEBRUARY 28, 1973.
L. D. Spicer. 1972, 8p
Contract AT (11-1)-2190

Descriptors: *Chlorine, *Chlorohydrocarbons, *Deuterium, *Methane, *Recoils, *Sulfur.

For abstract, see NSA 27 06, number 11846.

EURISOTOP-62 PC$3.00/MF$0.95
European Atomic Energy Community, Brussels (Belgium). Bureau Eurisotop.
IRRADIATION TECHNIQUES IN THE TEXTILE AND POLYMER INDUSTRY. BIBLIOGRAPHY, VOL. III.
R. Merkle. May 72, 192p
Lang- In Several Languages. U. S. Sales only

Descriptors: *Bibliographies, *Gamma radiation, *Plastics, *Textiles.

For abstract, see NSA 27 06, number 12266.

IS-T-539 PC$3.00/MF$0.95
Ames Lab., Iowa.
RADIOLYSIS OF TRIS (ETHYLENEDIAMINE) COBALT (III) SALTS.
David Witiak. Dec 72, 93p
Contract W-7405-ENG-82
Thesis.

Descriptors: *Cobalt, *Gamma radiation, *X radiation.

For abstract, see NSA 27 06, number 11781.

JINR-P6-6685 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Reactions.
POSSIBLE EXPRESS EXTRACTION OF EKATUNGSTEN AND EKARHENIUM FROM THE NUCLEAR REACTION PRODUCTS BY THE FRONTAL THERMOCHROMATOGRAPHY OF VOLATILE INORGANIC COMPOUNDS.
V. Z. Belov, I. Zvara, Yu. S. Korotkin, M. R. Shalaevskii, and V. A. Shchegolev. 1972, 15p
Lang- In Russian. U. S. Sales only

Descriptors: *Rhenium, *Transactinide elements, *Tungsten.

For abstract, see NSA 27 06, number 11849.

KFK-1657 PC$3.00/MF$0.95
Kernforschungszentrum, Karlsruhe (West Germany). Institut Fuer Radiochemie.
MIXED COMPLEXES AND HIGHER UNILIGAND COMPLEXES OF FIVE VALENT NEPTUNIUM- THE COORDINATION NUMBER OF NPO/SUB 2//SUP +/ IONS.
H. Stoeber. Jul 72, 71p
Lang- In German. U. S. Sales only

Descriptors: *Neptunium.

For abstract, see NSA 27 06, number 11850.

LA-DC-72-1517 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
ELUCIDATION OF ACTINIDE FLUORIDE STRUCTURES USING SINGLE CRYSTAL X RAY AND OPTICAL MICROSCOPY TECHNIQUES.
R. A. Penneman, and R. R. Ryan. 1972, 21p
CONF-720931-3
From Symposium On The Chemistry Of The Transuranium Elements- Moscow, Ussr (4 Sep 1972).

Descriptors: *Cerium, *Thorium, *Uranium.

For abstract, see NSA 27 06, number 11851.

N73-16115 PC$5.75/MF$0.95
Freiburg Univ. (West Germany). Inst. Fuer Radiologie.
RADIATION DAMAGE IN ORGANIC, BIOLOGICALLY IMPORTANT SUBSTANCES AND PLASTICS. USE OF PARAMAGNETIC AND NUCLEAR RESONANCE FOR PROOF AND IDENTIFICATION OF FORMED RADICALS . STRAHLENSCHAEDEN IN ORGANISCHEN, SPEZIELL BIOLOGISCHEN PRAEPARATEN UND KUNSTSTOFFEN. ERFORSCHUNG MITTELS PARAMAGNETISCHER RESONANZ UND KERNRESONANZ DURCH NACHWEIS UND IDENTIFIZIERUNG DER GEBILDETEN RADIKALE.
H. Langendorff, and H. Moenig. 1972, 73p
BMVG-FBWT-72-6
Subm- Sponsored By Bundesmin. Fuer Verteidigung

Descriptors: *Electron paramagnetic resonance, *Free radicals, *Ionizing radiation, *Radiation damage, Aliphatic compounds, Proteins, Pyridoxine, Sulfur.

For abstract, see STAR 11 07.

ORO-2001-28 PC$3.00/MF$0.95
Florida State Univ., Tallahassee.
RADIATION INDUCED EFFECTS IN ORGANIC SYSTEMS. PROGRESS REPORT, DECEMBER 1, 1971-DECEMBER 15, 1972.
R. H. Johnsen. 1972, 121p
Contract AT (40-1)-2001

Descriptors: *Amino acids, *Cations, *Crystals, *Electrons, *Free radicals, *Gamma radiation, *Hydrogen, *Methyl radicals, *Nitrogen oxides no, *Organic compounds, *Oxygen ions ORJ, *Rare gases.

For abstract, see NSA 27 06, number 11782.

8. EARTH SCIENCES AND OCEANOGRAPHY

8A. Biological Oceanography

JPRS-58216 PC$3.00/MF$0.95
Joint Publications Research Services, Arlington, Va.
HOW TO INCREASE THE BIOLOGICAL RESOURCES OF THE CASPIAN,
Yu. Yu. Marti. 13 Feb 73, 24p
Trans. of Priroda (USSR) n12 p28-39 1972.

Descriptors: (*Water pollution, *USSR), (*Marine biology, Water pollution), Aquatic animals, Fishes, Translations.
Identifiers: Caspian Sea, Volga Basin, Ural Basin, Water pollution control, Water pollution effects (Animals).

The report studies the problem of pollution of the Caspian Sea and the Volga and Ural basins and ways of protecting and increasing their biological resources.

JPRS-58344 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
THE OPERATING PRINCIPLE OF THE ECHOLOCATION SYSTEM OF MARINE ANIMALS,
V. V. Koshovyi, and V. M. Mykhailovskyi. 28 Feb 73, 12p
Trans. of Akademiya Nauk URSR, Kiev. Dopovidi. Seriya A: Fiziko-Tekhnichni ta Matematichni Nauki, n12 p1097-1105 1972.

Descriptors: (*Aquatic animals, *Underwater acoustics), Underwater objects, Underwater sound sources, Reflection, Bionics, Experimental data, Dolphins (Mannals), Wave equations, Translations, USSR.

The report contains a theoretical analysis and calculations showing that on the basis of the amplitude-frequency characteristics of reflected acoustic signals marine animals can recognize cylinders (and, consequently bodies of different form) by materials and dimensions. (Author)

8B. Cartography

E73-10305 PC$3.25/MF$0.95
Alaska Univ., College. Inst. of Artic Biology.
A NEW VEGETATION MAP OF THE WESTERN SEWARD PENINSULA, ALASKA, BASED ON ERTS-1 IMAGERY.
Interim scientific rept.,
James H. Anderson, and Albert E. Belon. 20 Feb 73, 22p NASA-CR-130717
Contract NAS5-21833

Descriptors: Imagery, Mapping, Vegetation, Alaska, Earth resources program, Regional planning, Land use, Management Planning, Resources management.

The author has identified the following significant results. A reconstituted, simulated color-infrared ERTS-1 image covering the western Seward Peninsula was prepared and it is used for identifying and mapping vegetation types by direct visual examination. The image, NASA ERTS E-1009-22095, was obtained approximately at 1110 hours, 165 degrees WMT on August 1, 1972. Seven major colors are identified. Four of these are matched with units on existing vegetation maps: bright red - shrub thicket; light gray-red - upland tundra; medium gray-red - coastal wet tundra; gray - alpine barrens. The three colors having no map equivalents are tentatively interpreted as follows: pink - grassland tundra; dark gray-red - burn scars; light orange-red - senescent vegetation. A vegetation map, drawn by tracing on an acetate overlay of the image is presented. Significantly more information is depicted than on existing maps with regards to vegetation types and their areal distribution. Furthermore the preparation of the new map from ERTS-1 imagery required little time relative to conventional methods and extent of areal coverage.

E73-10329 PC$3.00/MF$0.95
Geological Survey, Washington, D.C.
CARTOGRAPHIC EVALUATION OF ERTS ORBIT AND ATTITUDE DATA.
Progress rept. 1 Jul-31 Dec 72,
Robert B. McEwen. 1 Jan 73, 9p NASA-CR-130772
Contract NASA Order S-70243-AG
Original contains imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S.D. 57198.

Descriptors: Mapping, Imagery, Multispectral band scanners, Earth resources program, Errors, Satellite orbits, Attitude stability, Geometry.

The author has identified the following significant results. Without the required RBV images, increased attention has been directed toward revaluating the geometric quality of MSS images. A line scan anomaly was identified and analyzed. Successive generations of images have been checked for variations in geometric distortion; it has been consistent. Some recent MSS images have about 250 m rms of relative positional accuracy although earlier images were generally over 300 m. Efforts are continuing to isolate systematic errors in MSS images but present results are inconclusive.

E73-10340 PC$3.00/MF$0.95
Geological Survey, Washington, D.C.
LAND USE MAPPING AND MODELLING FOR THE PHOENIX QUADRANGLE.
Progress rept. 1 Jan-28 Feb 73,
John L. Place. 1 Mar 73, 7p NASA-CR-130790
Contract NASA Order S-70243-AG

Descriptors: Land use, Mapping, Phoenix quadrangle (Az), Agriculture, Urban development, Earth resources program, Imagery, Multispectral photography.

The author has identified the following significant results. Comparison of 9 x 9 MSS band images and color composites made from bands 4, 5, and 6 showing vegetated areas near Phoenix during the summer and fall seasons aided in definitely establishing that certain land areas were being used as agricultural land and not as rangeland. Agricultural land, which appeared to be fallow, idle, or not irrigated, often became more readily identifiable as agricultural land when comparing different images of identical land areas which have been affected by seasonal vegetation changes. Experimentation with color density slicing portions of 9 x 9 MSS band 7 transparency showing the central urban core of Phoneix enabled dense commercial and industrial areas to be separated from less dense urbanized land uses; however, loss of resolution produced results of limited usefulness. The best results in agricultural areas near Sun City were obtained using MSS band 5 imagery. Discrimination of different land uses in both urban and agricultural areas which were color density sliced was not possible to the degree of accuracy necessary to make mapping feasible. Examination of MSS transparencies and color composites allowed updating of a map of land use change in the Phoenix Quadrangle.

N73-16423 PC$3.50/MF$0.95
Purdue Univ., Lafayette, Ind. Lab. for Applications of Remote Sensing.
ADP OF MULTISPECTRAL SCANNER DATA FOR LAND USE MAPPING.
R. M. Hoffer. 1971, 26p NASA-CR-130372, LARS-INFORM-NOTE-080372
Contract NGL-15-005-112

Descriptors: *Agriculture, *Data processing, *Land use, *Multispectral photography, *Remote sensors, Computer techniques, Earth resources, Mapping, Satellite observation.

For abstract, see STAR 11 07.

8C. Dynamic Oceanography

AD-757 248 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
CALIFORNIA UNDERCURRENT RECONNAISSANCE BETWEEN MONTEREY AND SANTA BARBARA.
Master's thesis,
David Louis Molnar. Sep 72, 92p

Descriptors: (*Ocean currents, California), Temperature, Salinity, Curve fitting, Graphics.
Identifiers: Japanese current, Aleutian current, *California current, Monterey (California), Santa Barbara (California), Isotherms.

Continuous temperature and salinity profiles were made on nine sections of stations between Monterey and Santa Barbara to locate the California undercurrent. Temperature-salinity relations across all sections indicated the presence of southern water characteristic of the undercurrent. Tongues of high temperature water were found to extend northward implying northward and southward flow both at 200 and 300 meters. The sudden fall of isotherms coupled with a rise in isohalines across sections seven and eight together with the observation of numerous temperature inversions indicated the influx of warm, salty water from the south. (Author Modified Abstract)

AD-757 373 Reprint
Louisiana State Univ Baton Rouge Coastal Studies Inst
ENVIRONMENTAL FACTORS CONTROLLING THE SPREAD OF OIL.
Technical rept.,
Choule J. Sonu, Stephen P. Murray, and William G. Smith. 1971, 9p Rept no. TR-123
Contract N00014-69-A-0211-0003
Availability: Pub. in Naval Research Reviews, v24 n8 p11-19 Aug 71.

Descriptors: (*Water pollution, *Oils), (*Films, Oils), Ocean currents, Mexico Gulf, Tides, Wind, Density, Configuration.
Identifiers: *Oil spills, Oil slicks, Blowouts, Tidal currents, Air water interactions, Plumes, Oil wells, *Oil pollution, *Oil spreading process, Spreading.

On the basis of field observations at the time of a free spill from Chevron platform MP41C, located east of the Mississippi Delta, in February and March 1970, three environmental factors are identified as major controls over the behavior of the mass of oil discharging from a stationary source. These are wind-driven surface currents, tidal currents, and water-density distributions. Wind-induced surface currents caused downwind elongation of the oil slick. The rotary action of tidal current was responsible for the spiral curves of the oil slick, and, more important, for the limited excursion of the slick front in any given direction from the spilling source. (Author Modified Abstract)

AD-757 389 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
GUIDE FOR THE USE OF HOURLY TIDAL DATA PLOTTING PROGRAM.
Final rept.,
Larry L. Daggett. Sep 71, 73p Rept no. AEWES-Misc-Paper-H-71-10

Descriptors: (*Tides, *Computer programs), Instruction manuals, Tables, Diurnal variations, Altitude, Velocity, Salinity, Temperature, Estuaries, Hydraulic models.
Identifiers: FORTRAN 4 programming language, FORTRAN.

The report provides the required information for using the computer program described herein to calibrate and scale tidal data and to display these data in graphical and tabular form. The required input for the program is fully described, and the various output options are illustrated. Use of this digital computer program will allow more rapid and less expensive processing of hydraulic model data. (Author)

AD-757 425 PC$3.00/MF$0.95
Scripps Institution of Oceanography La Jolla Calif Advanced Ocean Engineering Lab
ADVANCED OCEAN ENGINEERING LABORATORY TECHNICAL PROGRESS REPORT.
Rept. of 1 Apr-31 Dec 72,
William A. Nierenberg, Walter H. Munk, Frank E. Snodgras, Charles S. Cox, and Michael C. Gregg. 14 Feb 73, 51p Rept nos. AOEL-35, SIO-Ref-73-3

Contract N00014-69-A-0200-6039, ARPA Order-2185
See also report dated 30 Jun 72, AD-748 024.

Descriptors: (*Ocean currents, Thermal properties), (*Ocean waves, Surface properties), (*Atmospheric motion, Interactions), Microstructure, Surface temperatures, Probes, Salinity, Surface roughness, Convection (Heat transfer), Electromagnetic waves, Stability, Buoyancy, Oceanographic equipment, Measurement, Anemometers, Turbulence, Wind.
Identifiers: Thermal microstructure, Surface waves, Internal waves, *Air-sea interactions.

The report reflects the technical status of internal/surface wave interaction and microstructure projects conducted within the Advanced Ocean Engineering Laboratory at the Scripps Institution of Oceanography. These projects are: (1) Thermal Microstructure - to examine in detail the structure and dynamics of temperature and salinity and (2) Atmospheric Boundary Layer - to provide an understanding of the interaction between atmospheric boundary effects and surface waves. (Author)

AD-757 655 PC$3.00/MF$0.95
Naval Research Lab Washington D C
RADAR SEA RETURN-JOSS II.
Final rept.,
J. C. Daley, J. T. Ransome, Jr., and W. T. Davis.
21 Feb 72, 20p Rept no. NRL-7534

Descriptors: (*Ocean waves, *Radar echo areas), Atlantic Ocean, Wind, Polarization.
Identifiers: Sea states.

Personnel at the Naval Research Laboratory have conducted a radar sea return measurement program in conjunction with the Joint Ocean Surface Study (JOSS II) sponsored by the Naval Oceanographic Office. The 4FR system was employed to obtain sea return data for various sea conditions as a function of radar wavelength and polarization for depression angles at and near the vertical. The results obtained were incorporated with previous measurements at vertical incidence and compared to recent theoretical predictions. (Author Modified Abstract)

COM-73-10404 PC$6.00/MF$0.95
Hawaii Inst. of Geophysics, Honolulu.
SURFACE-WAVE TRANSPORT IN NONUNIFORM CANALS,
R. W. Preisendorfer. Jul 72, 383p HIG-72-18
NOAA-73022702, NOAA-JTRE-80
Grant NSF-AG-253

Descriptors: (*Ocean waves, Boundary value problems), (*Canals, Surface waves), Hydrodynamics, Equations of motion, Partial differential equations, Mathematical models, Graphic methods, Tables (Data).

The boundary value problems of water wave propagation in classic linear canal theory are completely reformulated in terms of the transport concepts of reflection and transmission of nonuniform canal segments and abrupt junctions. This results in a relatively efficient numerical approach to the problem of predicting water wave elevations in nonuniform canals subsequent to invasion by external waves at the ends of the canal. The present treatment rests on two key ideas. The first idea is to conceptually split the surface-wave elevation into two counter-flowing waves in such a way as to be valid even in the nonuniform portions of canals; these wave components are governed by a pair of coupled first order linear ordinary differential (the 'two-flow') equations equivalent to the original classic second order canal equation. The second idea is to decompose a canal into simple modules whose reflectance and transmittance properties are determined numerically or analytically from the two-flow equations. (Author Modified Abstract)

E73-10330 PC$3.00/MF$0.95
Earth Satellite Corp., Washington, D.C.
APPLICATION OF ERTS-1 DATA TO THE PROTECTION AND MANAGEMENT OF NEW JERSEY'S COASTAL ENVIRONMENT.
Progress rept.,
Roland S. Yunghans, Edward B. Feinberg, and Frank J. Wobber. 2 Mar 73, 9p NASA-CR-130773
Contract NAS5-21765

Descriptors: Imagery, New Jersey, Coastal ecology, Environment protection, Earth resources program, Resources management, Coastal water, Coastal plains, Mapping.

The author has identified the following significant results. Photomaps, using MSS bands 5 and 7, have been prepared delineating the coastal zone as described in the Coastal Area Facility Review Act before the State Legislature. An upper wetlands boundary overlay has been prepared at 1:500,000 scale. The movement and dispersion of wastes in the New York Bight area are being plotted with each orbit. The possible impact of these wastes on the New Jersey shoreline is being quantified.

E73-10341 PC$4.25/MF$0.95
Ecole Pratiques Des Hautes Etudes, Paris (France).
MARSHES AND TURBID WATERS IN THE FRENCH ATLANTIC LITTORAL.
Progress rept. Oct 72-Feb 73,
Fernand Verger. 29 Feb 73, 43p NASA-CR-130800
Original contains color imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S.D., 57198.

Descriptors: France, Atlantic Ocean, Marshlands, Coastal plains, Coastal water, Earth resources program, Imagery, Geomorphology, Beaches, Dunes, Vegetation.

The author has identified the following significant results. The multispectral information provided by ERTS-1 is very rich for the coastal regions but the cloud cover, even when only partial, often cuts up the data, and lessens its practical value. The research by densitometric methods has thus far been the most fruitful. It consists of measuring densities along preferential axes. This method has enabled the investigators to perfect a system of computer cartography for the best image. Comparative study of microdensitometric transects in four MSS bands for carefully dilimited profiles on the ground, makes it possible to isolate and recognize various types of countryside: (1) countryside of coastal plains; (2) countryside of coastal sand dunes and beaches; and (3) forms and processes of offshore domains. This study shows the usefulness of the ERTS program in establishing a rapid cartography of the physiographic units of the coastal plains in the interest of a rational program of exploitation and development.

JPRS-58370 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
AERIAL PHOTOGRAPHIC AND ELECTROMAGNETIC DETERMINATION OF THE SEA SURFACE AND ITS CONDUCTIVITY,
A. G. Kravtsov, and I. M. Bondarenko. 2 Mar 73, 25p
Trans. of Okeanologiya (USSR) n6 p1095-1107 1972.

Descriptors: (*Sea states, Aerial photography), (*Radar echoes, Sea states), Remote sensing, Spectrum analysis, Sea water, Black Sea, Electrical conductivity, Translations, USSR.
Identifiers: Ocean surface.

The report contains an article on the relationship between wave parameters and the spatial spectrum of aerial photographs and radar images of the sea surface and an article on the use of the electromagnetic method for measurement of conductivity in the sea surface layer. (Author)

N73-16440 PC$7.75/MF$0.95
National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
DATA ON OCEAN CONDITIONS FOR SPACE SHUTTLE BOOSTER RECOVERY CRITERIA.
P. E. Beck. 1 Nov 72, 112p NASA-TM-X-68631, KSC-TR-1180-REV-1
Misc 0revised

Descriptors: *Booster recovery, *Sea states, *Space shuttle boosters, Graphs (charts), Sea roughness, Tables (data), Water waves.

For abstract, see STAR 11 07.

8D. Geochemistry

E73-10332 PC$3.00/MF$0.95
Geological Survey, Phoenix, Ariz. Water Resources Div.
APPLICATIONS OF ERTS-A DATA COLLECTION SYSTEM (DCS) IN THE ARIZONA REGIONAL ECOLOGICAL TEST SITE (ARETS).
Progress rept. 15 Oct-15 Dec 72,
Herbert H. Schumann. 15 Dec 72, 3p NASA-CR-130782
Contract NASA Order S-70243-AG

Descriptors: Data collection platforms, Arizona, Ecology, Test facilities, Earth resources program, Digital data, Water flow, Rivers.

The author has identified the following significant results. Preliminary analysis of DCS data from the USGS Verde River stream flow measuring site indicates the DCS system is furnishing high quality data more frequently than had been expected. During the 43-day period between Nov. 3, and Dec. 15, 1972, 552 DCS transmissions were received during 193 data passes. The amount of data received far exceeded the single high quality transmission per 12-hour period expected from the DCS system. The digital-parallel ERTS-1 data has furnished sufficient to accurately compute mean daily gage heights. These in turn, are used to compute average daily streamflow rates during periods of stable or slowly changing flow conditions. The digital-parallel data has also furnished useful information during peak flow periods. However, the serial-digital DCS capability, currently under development for transmitting streamflow data, should provide data of greater utility for determining times of flood peaks.

8E. Geodesy

AD-757 488 PC$3.00/MF$0.95
Air Force Cambridge Research Labs L G Hanscom Field Mass
SIMULTANEOUS RECOVERY OF SATELLITE AND STATION POSITIONS UTILIZING THE SHORT ARC METHOD.
Physical science research papers,
George Hadgigeorge. 20 Dec 72, 16p Rept nos. AFCRL-72-0748, AFCRL-PSRP-525
Presented at the Pan American Consulation on Cartography (12th), held at the Pan American Inst. of Geography and History, Panama (Panama), 1973.

Descriptors: (*Satellite tracking systems, Position finding), Geodesics, Scientific satellites, Orbital trajectories, Range finding.
Identifiers: SAGA (Short Arc Geodetic Adjustment), Short arc geodetic adjustment, Geoceivers, Geodetic satellites.

Results from short arc reductions, using continuous integrated doppler observations, verify that the satellite state vector can be recovered with the same accuracy as the position of an observing site when that satellite is ovserved by five or more properly oriented geoceivers. This method is applicable for continental and intercontinental survey recovery. (Author)

AD-757 540 PC$3.25/MF$0.95
Defense Mapping Agency Aerospace Center St Louis Mo Technical Translation Branch
ON THE NATURE OF THE EXTENSIVE GRAVITATIONAL ANOMALIES OF THE UKRAINIAN SHIELD (O PRIRODE OBSHIRNYKH GRAVITATSIONNYKH ANOMALII UKRAINSKOGO SHCHITA),
G. Ya. Golizdra, and A. K. Akhmetshina. Feb 73, 23p Rept no. DMAAC-TC-1886
Trans. of Akademiya Naul SSSR. Izvestiya. Fizika Zemli, n8 p91-99 1972, by George Synenko.

Descriptors: (*Gravity, Anomalies), Rock (Geology), Density, Structural geology, Magnetic fields, USSR.
Identifiers: Translations, Gravity anomalies, Ukrainian Shield.

The idea of the present article is that the extensive maximums in the Ukrainian shield are not connected with a continuous development of dense rocks, but only with their impregnation. However, on the average, the density of rocks within the maximums has an increased value in comparison with the surrounding territory. The main content of the present report is based on a corresponding model of the crustal structure. (Author)

AD-757 541 PC$3.00/MF$0.95
Defense Mapping Agency Aerospace Center St Louis Mo Technical Translation Branch
COMPUTATION OF THE GEODETIC COORDINATES OF AN AIRCRAFT FROM TWO MEASURED DISTANCES AND ITS HEIGHT ABOVE THE SURFACE OF THE EARTH ELLIPSOID (VYCHISLENIE GEODEZICHESKIKH KOORDINAT SAMOLETA PO DVUM IZMERENNYM RASSTOYANIYAM I EGO VYSOTE NAD POVERKHNOSTYU ZEMNOGO ELLIPSOIDA),
K. A. Laping, and L. V. Medvedev. Dec 72, 10p Rept no. DMAAC-TC-1888
Trans. of Geodeziya i Kartografiya (USSR) n3 p13-15 1972, by Walter L. Burton.

Descriptors: (*Position finding, Aircraft), Height finding, Range finding, Mathematical analysis, USSR.
Identifiers: Translations, Geodetic coordinates.

The paper discusses the computation of the geodetic coordinates of an aircraft from two measured distances and its height above the surface of the earth ellipsoid. The advantages of the suggested method of determination of an aircraft's coordinates are: it is not necessary to reduce the measured distances to the surface of the earth ellipsoid, it is not necessary to know the approximate geodetic coordinates of the aircraft, and the suggested formulas can be used advantageously in a computer. (Author)

AD-757 542 PC$3.00/MF$0.95
Defense Mapping Agency Aerospace Center St Louis Mo Technical Translation Branch
ON VAISALA'S METHOD (O SPOSOBE VYAISYALYA),
O. S. Razumov. Dec 72, 17p Rept no. DMAAC-TC-1889
Trans. of Geodeziya i Kartografiya (USSR) n3 p15-21 1972, by Walter L. Burton.

Descriptors: (*Satellite tracking systems, Triangulation), Synchronous satellites, Position finding, Mathematical analysis, USSR.
Identifiers: Translations, *Geodetic astronomy.

The paper discusses Vaisala's method of stellar triangulation, taking into consideration the geometric structure of the system being adjusted, the unequal accuracy of measurements at the stations and the systematic errors of registration of the moments of observations. (Author Modified Abstract)

N73-16347 PC$3.75/MF$0.95
National Aeronautics and Space Administration. Wallops Station, Wallops Island, Va.
AN ERROR ANALYSIS OF THE RECOVERY CAPABILITY OF THE RELATIVE SEA-SURFACE PROFILE OVER THE PUERTO RICAN TRENCH FROM MULTI-STATION AND SHIP TRACKING OF GEOS-2.
H. R. Stanley, C. F. Martin, N. A. Roy, and J. R. Vetter. May 71, 33p NASA-TM-X-69353, X-300-71-1
Contract NAS6-1942
Subm- Prepared Jointly With Wolf Res. and Develop. Corp., Riverdale, Md.

Descriptors: *Error analysis, *Geodetic surveys, *Gravimetry, *Ocean surface, *Puerto rico, Geoids, Geos 2 satellite, Optical measurement, Tracking radar.

For abstract, see STAR 11 07.

8F. Geography

E73-10302 PC$3.00/MF$0.95
Texas A and M Univ., College Station. Remote Sensing Center.
MONITORING THE VERNAL ADVANCEMENT AND RETROGRADATION (GREEN WAVE EFFECT) OF NATURAL VEGETATION.
Progress rept. no. 1, 27 Sep 27 Nov 72.
J. W. Rouse, Jr. 27 Nov 72, 18p NASA-CR-130385
Contract NAS5-21857

Descriptors: Imagery, Vegetation, Rangelands, Resources management, Great plains corridor (North America), Earth resources program, Agriculture, Decision making, Climate.

The author has identified the following significant results. The asserted homogeneity of the Great Plains Corridor was established, as evidenced from test site characteristic determinations. First-look visual analysis of ERTS-1 black and white images reveals the ability to locate network test sites. Geological formations associated with major vegetation types are readily apparent on the imagery. Grasslands are readily distinguishable from forested and cropped areas. Under magnification, pastures as small as five to ten acres can be recognized in areas of contrasting vegetation. Bodies of water (rivers, lakes, and large farm ponds) are easily located on bands 6 and 7. Urban areas and major highways are also easily observed and useful as landmarks.

E73-10326 PC$3.75/MF$0.95
Spectral Africa (Pty) Ltd., Randfontein (South Africa).
GROWTH AND DECLINE OF VEGETATION ON MINE DUMPS.
Progress rept. Nov 72-Jan 73,
B. P. Gilbertson. Jan 73, 32p 73 3 NASA-CR-130781
Original contains color imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S.D., 57198.

Descriptors: Vegetation, Mines (Excavations), South Africa, Earth resources program, Tectonics, Photogeology, Imagery.

The author had identified the following significant results. The main objective is to determine the extent to which ERTS-1 imagery can be used to differentiate between mine dumps having varying degrees of vegetative cover. At this stage it is clear that the various mine dumps can be located and identified. Differences in vegetative cover can be seen and measured. Patterns of vegetative growth, some characteristic to particular dumps, can also be seen. It is therefore tentatively concluded that mine dumps can be differentiated with respect to their vegetative cover on the imagery received to date, and this is reported as a significant result. Subsequent imagery showing seasonal variations should facilitate this program. In addition to work on the mine dumps, a photogeological project has been initiated on geotectonics of South Africa. Studies of ERTS-1 images has indicated that major structures (faults, folds, and linear features) associated with the three geotectonic environments can be identified. In addition, major as well as relatively minor stratigraphic subdivisions can be recognized by their color tones. Results obtained warrant continuation of this study using color composite prints enlarged to a scale of 1:500,000.

E73-10335 PC$3.00/MF$0.95
Bureau of Sport Fisheries and Wildlife, Washington, D.C.
AN EVALUATION OF ACQUIRED DATA AS A TOOL FOR MANAGEMENT OF WILDLIFE HABITAT IN ALASKA.
Progress rept. 1 Jan-38Feb 73,
Bill J. VanTries. 1 Mar 73, 3p NASA-CR-130785
Contract NASA Order S-70243-AG

Descriptors: Alaska, Habitats, Wildlife, Resources management, Earth resources program, Imagery, Vegetation, Hydrology, Lakes.

The author has identified the following significant results. Density sliced and digitized imagery of the Kuskokwin/Yukon Delta were analyzed. Color coded images of the isodensity displays were compared with existing vegetation maps of the ERTS-1 frames for the Yukon/Kuskokwin area. A high degree of positive correlation was found to exist between the ERTS-1 image and the conventionally prepared maps. Hydrologic phenomena were also analyzed. Digitization on South Dakota State Remote Sensing Center's SADE system provide some discrimination among several large lakes in the subject area. However, interpretation must await ground observations and depth measurements. An attempt will be made to classify large water bodies by depth classes.

JPRS-58369 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
ECONOMIC GEOGRAPHY OF CUBA,
E. B. Valev. 1 Mar 73, 63p
Trans. of mono. Ekonomicheskaya Geografiya Kuby, Moscow, 1972 43p.

Descriptors: (*Economic geography, *Cuba), Economic surveys, Agriculture, Resources, Maps, Translations, Tables (Data).

The report contains a survey of the economic geography of Cuba. Included is a general survey, a regional survey, and a discussion of the economy.

JPRS-58392 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
THEORETICAL PROBLEMS OF CONSERVATION OF ANTARCTIC RESOURCES UNDER INTERNATIONAL LAW,
V. A. Chichvarin. 5 Mar 73, 18p
Trans. from Antartika. Doklady Komissii (USSR) p156-168 1971.

Descriptors: (*Natural resources, Conservation), (*Antarctic regions, Natural resources), International law, Reviews, Pollution, Wildlife, Minerals, Translations, USSR.

The Russian report contains a review of theoretical problems of the conservation of Antarctic resources under international law.

N73-16160 PC$4.50/MF$0.95
Aerojet Electrosystems Co., Azusa, Calif.
EARTH RESOURCES DATA ANALYSIS SYSTEM.
Final Report
Oct 72, 47p NASA-CR-128693, REPT-1746FR-1
Contract NAS9-12106

Descriptors: *Data processing, *Earth resources program, *Microwave imagery, *Multispectral photography, *Radiometers, Black and white photography, Color photography, Computer programming, Multispectral band scanners.

For abstract, see STAR 11 07.

N73-16348 PC-GPO/MF$0.95
National Aeronautics and Space Administration, Washington, D.C.
INTERNATIONAL WORKSHOP ON EARTH RESOURCES SURVEY SYSTEMS, VOLUME 1.
1972, 359p NASA-SP-283-VOL-1, LC-72-180875
Conf- Workshop Held At Ann Arbor, Mich., 3-14 May 1971 Sponsored in Part By Dept. of Agr., Dept. of Interior, Noaa, Dept. of Commerce, Naval Oceanog. Office, Aid, and Dept. of State
Paper copy available from GPO $6.00.

Descriptors: *Conferences, *Earth resources, *Earth surface, *Oceanography, *Remote sensors, *Systems engineering, Aerial photography, Agriculture, Earth resources program, Forests, Geodesy, Geology, Radar imagery.

For abstract, see STAR 11 07.

N73-16382 PC-GPO/MF$0.95
National Aeronautics and Space Administration, Washington, D.C.
INTERNATIONAL WORKSHOP ON EARTH RESOURCES SURVEY SYSTEMS, VOLUME 2.
1971, 611p NASA-TM-X-68912
Conf- Workshop Held At Ann Arbor, Mich., 3-14 May 1971 Sponsored in Part By Dept. of Agr., Dept. of Interior, Noaa, Naval Oceanog. Office, Agency for Intern. Develop., and Dept. of State
Paper copy available from GPO $5.25.

Descriptors: *Aerial photography, *Conferences, *Multispectral band scanners, *Remote sensors, Agriculture, Data acquisition, Data processing, Earth resources program, Geology, Oceanography.

For abstract, see STAR 11 07.

N73-16435 PC$3.00/MF$0.95
Purdue Univ., Lafayette, Ind. Lab. for Applications of Remote Sensing.
AUTOMATIC CLASSIFICATION OF SOILS AND VEGETATION WITH ERTS-1 DATA.
D. A. Landgrebe. 1972, 10p NASA-CR-130021, LARS-PRINT-101472
Contracts NAS5-21773, NGL-15-005-112
Conf- Presented At 23d Intern. Astronaut. Congr., Vienna, 14 Oct. 1972

Descriptors: *Computer techniques, *Earth resources technology satellite a, *Photointerpretation, Lake texoma (ok-tx), Soils, Vegetation.

For abstract, see STAR 11 07.

N73-16494 PC$3.50/MF$0.95
Purdue Univ., Lafayette, Ind. Lab. for Applications of Remote Sensing.
A THREE STAGE SAMPLING MODEL FOR REMOTE SENSING APPLICATIONS.
L. M. Eisgruber. 1972, 28p NASA-CR-130026, INFORM-NOTE-021072
Contract NGL-15-005-112

Descriptors: *Aerial reconnaissance, *Estimates, *Remote sensors, *Sampling, Earth resources, Error analysis, Mathematical models, Photointerpretation, Statistical analysis.

For abstract, see STAR 11 07.

N73-16495 PC$3.00/MF$0.95
Purdue Univ., Lafayette, Ind. Lab. for Applications of Remote Sensing.
THE IMPORTANCE OF GROUND TRUTH DATA IN REMOTE SENSING.
R. M. Hoffer. 1972, 13p NASA-CR-130020, LARS-PRINT-120371
Contract NGL-15-005-112
Conf- Presented At Un Panel Meeting on the Estab. and Implementation of Res. Programs in Remote Sensing, San Jose Dos Campos, Brazil, 29 Nov. - 10 Dec. 1971

Descriptors: *Ground truth, *Remote sensors, Chemical properties, Physical properties, Statistical analysis, Vegetation.

For abstract, see STAR 11 07.

N73-16876 PC$3.75/MF$0.95
Modern Systems Analysis, Inc., Ann Arbor, Mich.
NEAR-EARTH ORBITAL GUIDANCE AND REMOTE SENSING.
Final Report
W. F. Powers. Dec 72, 32p NASA-CR-128713, REPT-9-12319-F
Contract NAS9-12319

Descriptors: *Numerical analysis, *Optimization, *Remote sensors, *Trajectory analysis, Equipment specifications, Measuring instruments, Product development, Test equipment.

For abstract, see STAR 11 07.

8G. Geology and Mineralogy

AD-757 123 Reprint
Lamont-Doherty Geological Observatory Palisades N Y
ANTARCTIC QUATERNARY CLIMATIC RECORD AND RADIOLARIAN AND DIATOM EXTINCTIONS.
Journal article,
J. D. Hays, and Jessie G. Donahue. 1972, 9p Rept no. LDGO-1643
Contract N00014-67-A-0108-0004, Grant NSF-GA-21174
Sponsored in part by Grant NSF-GA-19690. Offprint from Antarctic Geology and Geophysics.
Availability: Pub. in International Union of Geological Sciences, Series B, n1 p733-738 1972.

Descriptors: (*Ocean bottom sampling, Climatology), (*Antarctic regions, Climatology), Radiolaria, Algae, Plants (Botany), Stratigraphy, Correlation techniques, Terrestrial magnetism, Deep water, Sea ice, Sedimentation, Pacific Ocean, Marine geology.
Identifiers: Diatoms, *Paleoclimatology, Bioclimatology, Paleomagnetism.

The combined radiolarian and diatom stratigraphy of Antarctic deep-sea sediments provides numerous closely spaced datum levels. The fossil record of these sediments indicates a general cooling trend during the last 2.5 m yr. There is a pronounced cooling at about 700,000 yr which is followed by about seven strong climatic oscillations. During the last 2.5 m yr four of the five species of Radiolaria that became extinct do so in close proximity to geomagnetic reversals. Diatom extinctions show a much lower degree of correlation with geomagnetic reversals. The prominent lithological change from nearly barren sediments below to highly diatomaceous sediments above that occurred in Antarctic deep-sea sediments about 2 m yr ago may be related to the formation of the large ice shelves and the concomitant increase of sea-ice volume around the Antarctic continent. (Author)

AD-757 391 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
PLAN FOR SURFACE STORAGE OF SALT TATUM DOME, LAMAR COUNTY, MISSISSIPPI.
Jul 62, 46p Rept no. AEWES-Misc-Paper-3-509

Descriptors: (*Rock salt, Storage), (*Underground explosions, Site selection), Nuclear explosions, Structural geology, Water pollution, Clay, Drainage, Construction, Feasibility studies.
Identifiers: Lamar County (Mississippi), Tatum salt dome.

The report describes the requirements for salt storage and the limitations placed on site selection; geological and terrain considerations affecting the design of the salt-storage area; and the recommended plan of storage.

AD-757 574 Reprint
Colorado State Univ Fort Collins Dept of Geology
EVOLUTION OF A DISCONTINUOUS GULLY STREAM,
M. Paul Mosley. 16 Jun 72, 12p AROD-8525:2-EN
DA-ARO-D-31-124-70-G13
Availability: Pub. in Annals of the Association of American Geographers, v62 n4 p655-663 Dec 72.

Descriptors: (*Terrain, *Erosion), Colorado, Wind, Countermeasures.
Identifiers: *Geomorphology, Colorado Piedmont, Gullies, Wind erosion, *Discontinuous gully systems.

A discontinuous gully system which consists of a series of discrete basins has developed on an alluvial valley fill in northern Colorado. Field evidence suggests that shallow depressions develop, under the influence of overland flow, from initial breaks in the vegetation cover. As a depression becomes to deep to allow water to lift material out, wind takes on the role of removing particles from the basin, and overland flow and slumping continue to extend it. Eventually successive basins coalesce, allowing water to flow throughout the system and once again become the predominant erosive agent. It appears that the gully system has developed under the influence of geomorphic agents which operate infrequently, during heavy rain or strong winds. These discontinuous gully systems are quite widespread, and have some impact on the rangeland economy. The development of the incipient basins may be prevented by planting shrubs and grass, and well-developed basins may be stabilized by the use of water spreaders and planting. (Author)

E73-10281 PC$3.00/MF$0.95
Montana Univ., Missoula. Dept. of Geology.
APPLICABILITY OF ERTS-1 TO MONTANA GEOLOGY.
Progress rept.,
Robert M. Weidman. 19 Feb 73, 2p NASA-CR-130564
Contract NAS5-21826

Descriptors: Imagery, Geology, Montana, Mapping, Earth resources program, Tectonics, Structural properties (Geology), Geological faults.

The author has identified the following significant results. Rapid construction of a lineament map for western Montana, drawn as an overlay to a late August band 7 mosaic at a scale of 1:1,000,000 indicates ERTS-1 imagery to be very suitable for quick compilation of topographically expressed lineaments representing scarps and straight canyons. Over 100 such lineaments were detected, ranging in length from 80 down to 5 miles. Most of the major high angle faults of the area are represented, but low angle faults such as the Lewis overthrust are not apparent. Short and medium length lineaments of northeast trend are abundant southeast of a line connecting Missoula and Great Falls. Only about half of the lineaments are shown on the state geologic map, and limited comparisons with more detailed maps suggest that many will merit investigation as possible faults. It is already apparent that ERTS-1 imagery will be useful in construction of a needed tectonic map of Montana.

E73-10296 PC$3.00/MF$0.95
Servicio Geologico de Bolivia, La Paz.

BOQUEJO SOBRE LA GEOLOGIA ESTRUCTURAL Y EL VULCANISMO EN EL ALTIPLANO CENTRAL DE LOS ANDES BOLIVIANOS (SKETCH ON THE STRUCTURAL GEOLOGY AND VULCANISM IN THE CENTRAL HIGH PLATEAU OF THE BOLIVIAN ANDES),
Carlos E. Brockman. Jan 73, 18p NASA-CR-130791
Text in Spanish.

Descriptors: Bolivia, Structural properties (Geology), Volcanology, Plateaus, Mountains.

The author has identified the following significant results. The Earth Resources Technology Satellite Program has as an objective the development of tectonic maps for Bolivia. Maps were prepared using the images of ERTS-1 in a preliminary study of alignments observed and rapidly interpreted in images 1010-14033-3-4-5-6-7 on a scale of 1:1,000,000, and later verified on the ground with corresponding fault zones. This information was not shown on existing geological maps. The ERTS-1 imagery was used in volcanology research for drawing the regional limits of volcanic formations as soon as the alignment and the extent of the volcanoes could be determined. The extensive coverage of ERTS-1 images provides an excellent opportunity for developing studies of regional structures.

E73-10301 PC$3.75/MF$0.95
Wyoming Univ., Laramie. Remote Sensing Lab.
DISTINGUISHING MAJOR LITHOLOGIC TYPES IN ROCKS OF PRECAMBRIAN AGE IN CENTRAL WYOMING USING MULTILEVEL SENSING WITH A CHAPTER ON POSSIBLE ECONOMIC SIGNIFICANCE OF IRON FORMATION DISCOVERED BY USE OF AIRCRAFT IMAGES I N THE GRANITE MOUNTAINS OF WYOMING.
Special rept.
Robert S. Houston. 16 Feb 73, 34p ERTS-1-572-3 NASA-CR-130557
Contract NAS5-21799
Original contains imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Avenue, Sioux Falls, S. Dak., 57198.

Descriptors: Imagery, Lithology, Wyoming, Precambrian period, Rocks, Earth resources program, Iron ores, Granite, Aerial photography.

The author has identified the following significant results. Information obtained by remote sensing from three altitude levels: ERTS-1 (565 miles), U-2 (60,000 feet), and C-130 aircraft (15,000 feet) illustrates the possible application of multilevel sensing in mineral exploration. Distinction can be made between rocks of greenstone belts and rocks of granite-granite gneiss areas by using ERTS-1 imagery in portions of the Precambrian of central Wyoming. Study of low altitude color and color infrared photographs of the mafic terrain revealed the presence of metasedimentary rocks with distinct layers that were interpreted as amphibolite by photogeologic techniques. Some of the amphibolite layers were found to be iron formation when examined in the field. To our knowledge this occurrence of iron formation has not been previously reported in the literature.

E73-10321 PC$3.00/MF$0.95
Geological Survey, Menlo Park, Calif.
IDENTIFICATION OF GEOSTRUCTURES OF CONTINENTAL CRUST PARTICULARLY AS THEY RELATE TO MINERAL RESOURCE EVALATION.
Progress rept. 1 Jul-31 Dec 72,
George Gryc, and Ernest H. Lathram. 31 Dec 72, 5p NASA-CR-130739
Contract NASA Order S-70243-AG-1

Descriptors: Imagery, Structural properties (Geology), Earth crust, Mineral deposits, Alaska, Earth resources program, Arctic regions, Sediments, Lakes, Mineral exploration, Oil exploration.

The author has identified the following significant results. Lakes in the Arctic Coastal Plain of Alaska are dominantly elongate, with their long axes parallel and trending about N9W. On ERTS-1 imagery, an additional strong east-trending regional lineation, not previously recognized on aerial photographs or in field study, was noted. In addition, the alignment of many small lakes forms a large and a small ellipse superimposed on the regional lineation. Fischer and Lathram find that the trend of this lineation is parallel to the trend of deflections in contours of the magnetic and gravity field in the area, and parallel to westerly deflections in the northwest ends of northwest-trending folds mapped to the south. These data suggest that heretofore unsuspected structures may be concealed beneath Quaternary mantling sediments in the area of the image. The strata in these folds would be younger than those tapped by the oil wells of the Umiat field to the south, and favorable sandstone facies may occur in the area. The significance of these observations to oil exploration in northern Alaska needs to be evaluated further. (Author)

E73-10338 PC$3.00/MF$0.95
Geological Survey, Washington, D.C.
IRON ABSORPTION BAND ANALYSIS FOR THE DISCRIMINATION OF IRON RICH ZONES.
Progress rept. 1 Jul-31 Dec 72,
Lawrence C. Rowan. 30 Jan 73, 12p NASA-CR-130788
Contract NASA Order S-70243-AG

Descriptors: Imagery, Earthquakes, Geological faults, Nevada, Earth resources program, Structural properties (Geology), Minerals, Vegetation, Iron ores.

The author has identified the following significant results. A lineament study of the Nevada test site is near completion. Two base maps (1:500,000) have been prepared, one of band 7 lineaments and the other of band 5 lineaments. In general, more lineaments and more faults are seen on band 7 than on band 5. About 45% of the lineaments appear to be faults and contacts, the other being predominantly streams, roads, railway tracks, and mountain crests. About 25% of the lineaments are unidentified so far. Special attention is being given to unmapped extensions of faults, groups of unmapped lineaments, and known mineralized areas and alteration zones. Earth epicenters recorded from 1869 to 1963 have been plotted on the two base maps. Preliminary examination as yet indicates no basic correlation with the lineaments. Attempts are being made to subtract bands optically, using an I2S viewer, an enlarger, and a data color viewer. Success has been limited so far due to technical difficulties, mainly vignetting and poor light sources, within the machines. Some vegetation and rock type differences, however, have been discerned.

E73-10355 PC$3.00/MF$0.95
Argus Exploration Co., Newport Beach, Calif.
A RECONNAISSANCE SPACE SENSING INVESTIGATION OF CRUSTAL STRUCTURE FOR A STRIP FROM THE EASTERN SIERRA NEVADA TO THE COLORADO PLATEAU.
Progress rept. 1 Jan-28 Feb 73,
Ira C. Bechtold. 15 Mar 73, 9p NASA-CR-130970
Contract NAS5-21809

Descriptors: Structural properties (Geology), Earth crust, Imagery, Colorado Plateau (US), Sierra Nevada Mountains (CA), Earth resources program, Geological faults, Tectonics, Volcanology, Minerals, Nevada, Arizona, Structural basins.

The author has identified the following significant results. Analysis of ERTS-1 MSS imagery over the southern Basin-Range Province of California, Nevada, and Arizona has led to recognition of regional tectonic control of volcanism, plutonism, mineralization, and fault patterns. This conclusion is the result of geologic reconnaissance of anomalies observed in ERTS-1 and Apollo-9 data, guided by intermediate scale U-2 photography, SLAR, and relevant geologic literature. In addition to regional tectonic studies, the ERTS-1 imagery provides a basis for detailed research of relatively small geologic features. Interpretation of ERTS-1 and Apollo-9 space imagery and intermediate scale X-15 and U-2 photography indicates the presence of a major fault zone along the California-Nevada state line, here named the Pahrump fault zone. Field mapping confirms previously unreported evidence of fault breaks in bedrock, along range fronts and in Quaternary alluvium and lake sediments. Regional gravity lows and fault traces within the Pahrump fault zone form a general left stepping en echelon pattern. The trend and postulated displacement for this fault are similar to other major strike slip fault zones in the southern Basin-Range Province.

E73-10358 PC$3.00/MF$0.95
New Mexico State Bureau of Mines and Mineral Resources, Socorro.
GEOLOGICAL ANALYSIS AND EVALUATION OF ERTS-A IMAGERY FOR THE STATE OF NEW MEXICO.
Progress rept. 23 Jul 72-14 Mar 73,
Frank E. Kottlowski. 14 Mar 73, 10p NASA-CR-130973
Contract NAS5-21861

Descriptors: Imagery, New Mexico, Structural properties (Geology), Earth resources program, Multispectral photography, Photogeology, Vegetation, Geological faults.

The author has identified the following significant results. Coverage of approximately one-third of the test site had been received by January 31, 1973 and all of the images received were MSS products. Images recorded during the first two months of the ERTS-1 mission were of poor quality, owing largely to high ground reflectance. Later images were of better quality and MSS bands 5 and 7 have proven to be particularly useful. Features noted during visual inspection of 9 1/2 x 9 1/2 prints include major structural forms, vegetation patterns, drainage patterns, and outcrops of geologic formations having marked color contrasts. The Border Hills Structural Zone and the Y-O Structural Zone are prominently reflected in coverage of the Pecos Valley. A study of available maps and remote sensing material covering the Deming-Columbus area indicated that the limit of detection and the resolution of MSS products are not as good as those of aerial photographs, geologic maps, and manned satellite photographs. The limit of detection of high contrast features on MSS prints is approximately 1000 feet or 300 meters for linear features and about 18 acres for roughly circular areas.

N73-16418 PC$3.00/MF$0.95
Osservatorio Geofisico Sperimentale, Trieste (Italy).
REGIONAL REFLECTION SEISMIC EXPLORATION OF THE STRAIT OF SICILY.
I. Fingetti, and C. Morelli. 1973, 16p
SACLANTCEN-CONF-PROC-7, CONTRIB-212
Subm- Sponsored By Cnr

Descriptors: *Islands, *Italy, *Seismic waves, Channels, Digital systems, Multichannel communication, Reflection.

For abstract, see STAR 11 07.

PB-215 814/5 PC$3.00/MF$0.95
Bureau of Mines, Washington, D.C.
DETERMINATION OF PALEOTECTONIC PRINCIPAL STRESS DIRECTION, INCLUDING ANALYSIS OF JOINTS BY OPTICAL DIFFRACTION.
Rept. of investigations,

Robert C. Steckley. Jan 73, 23p BuMines-RI-7706
Prepared in cooperation with Twin Cities Mining Research, Minn.

Descriptors: (*Geologic structures, Tectonics), (*Rock mechanics, Fracture zones), Stresses, Diffraction, Deformation, Fragmentation, Wisconsin.
Identifiers: Marathon County (Wisconsin).

A study of joints in Marathon County, Wisconsin, was made to determine the orientation of regional paleotectonic stresses and to develop a method of using optical diffraction analysis in studying joint orientations and spacings. Initially standard geologic and petrofabric techniques employing the use of a geologic compass and a Schmidt net were used in gathering, describing, and reducing joint orientation data. Analysis of these data suggested that a horizontal paleotectonic maximum principal compressive stress, sigma sub 1, trending northwest-southeast produced the system of joints found in the area. Because cross-cutting relationships indicate that joints are the youngest deformation features in Marathon County, this stress, sigma sub 1, is likely the most recent maximum principal compressive stress to exist during deformation of the rocks in the country.

PB-215 815/2 PC$3.00/MF$0.95
Bureau of Mines, Washington, D. C.
ADHESION AT CRYSTALLINE INTERFACES IN ROCK.
Rept. of investigations,
George A. Savanick, and Donald I. Johnson. Jan 73, 21p BuMines-RI-7709
Prepared in cooperation with Twin Cities Mining Research Center, Minn.

Descriptors: (*Granite, Tensile strength), (*Pegmatite, Tensile strength), (*Rock mechanics, Tension tests), Adhesion, Interfaces, Crystal structure, Quartz, Feldspars, Fragmentation, Feasibility.

A method has been developed for extracting bicrystals from a rock and determining the tensile strength at the interface between the minerals. This technique has been successfully applied to the study of quartz-feldspar interfaces separated from massive pegmatites, graphic granites, and the Rockville granite yielding average tensile strengths of 850, 1,250, and 1,524 psi respectively. These data indicate that the members of the bicrystal are strongly adherent. Examination of bicrystals broken at the crystalline interface indicates that the bonds responsible for this adhesion operate only over a portion of the interfacial area. This work conclusively demonstrates that tensile strength tests can be conducted on small selected areas in rock. (Author Modified Abstract)

PB-215 817/8 PC$3.00/MF$0.95
Bureau of Mines, Washington, D.C.
PHASE-CONTRAST ENHANCEMENT WITHOUT SPATIAL FILTERS FOR SEISMIC HOLOGRAPHY.
Rept. of investigations,
G. L. Fitzpatrick. Jan 73, 22p BuMines-RI-7721
Prepared in cooperation with Denver Mining Research Center, Colo.

Descriptors: (*Tectonics, Three dimensional display systems), (*Seismic waves, *Holography), Underground surveys, Holograms, Data processing.
Identifiers: *Seismic holography, Acoustic holography, Computer generated holograms.

Future applications of seismic holography to 'seismically transport phase objects' such as rock inclusions, fracture zones, liquid filled cavities, etc., will require techniques to improve the poor image contrast generally characteristic of these objects. Conventional phase contrast enhancement techniques could be used; however, the conventional methods of achieving phase contrast enhancement involve additional optical elements such as quarter wave spatial filters. A similar result may be achieved, however, without spatial filters by specially processing the seismic hologram data. The new process, which is an extension of Gabor's subtraction holography, achieves an improvement in contrast by an interferometric technique. The new technique is experimentally verified by examing computer generated synthetic seismic holograms rather than actual seismic field data. (Author Modified Abstract)

PB-216 069/5 PC$3.00/MF$0.95
Virginia Highway Research Council, Charlottesville.
POTENTIALLY REACTIVE CARBONATE ROCKS. A STRATEGY FOR USE AND CONTROL OF POTENTIALLY REACTIVE CARBONATE ROCKS (INCLUDING AN ANNOTATED BIBLIOGRAPHY OF VIRGINIA RESEARCH). PROGRESS REPORT NO. 8.
Joint rept.,
Howard H. Newlon, Jr., W. Cullen Sherwood, and Michael A. Ozol. Jun 72, 22p VHRC-71-R41
See also Progress Rept. no. 6, PB-204 042.

Descriptors: (*Carbonate rocks, *Alkali aggregate reactions), (*Highways, *Concrete pavements), Concrete durability, Aggregates, Quarrying, Quality control, Sampling, Bibliographies.
Identifiers: *Alkali carbonate reactions.

The report outlines a strategy for the use and control of concrete aggregates from sources that may contain dolomite limestones deleteriously reactive with cement alkalies. The recommendations are based upon the results from a comprehensive research project which has included studies of materials characteristics, the mechanisms of reaction, testing methods, and field performance. The annonated bibliography contained in the report includes 34 reports, papers, and presentations from the Council's research that form the bases for the recommendations. The goal of the control program is to avoid the inclusion of reactive aggregates in concrete or if this is impossible to reduce their amount to less than 20 percent of the aggregate content. (Author Modified Abstract)

PB-216 086/9 PC$6.00/MF$0.95
Colorado School of Mines, Golden. Dept. of Mining.
DEVELOPMENT OF A TUNNEL BOREABILITY INDEX.
Final rept.,
Norman Ross, and William Hustrulid. Feb 72, 378p* REC-ERC-72-7
Contract DI-14-06-D-6849

Descriptors: (*Rock properties, Predictions), (*Tunneling (Excavation), Rock properties), Tunneling machines, Rock mechanics, Compressive properties, Indentation hardness tests, Rock tests, Boring machines, Petrography.
Identifiers: *Rock boreability index.

Three laboratory rock testing methods for making tunnel boreability predictions were investigated. They were: (1) uniaxial compressive strength, (2) linear cutter, and (3) button indentation. Although some relationship was observed between the energy needed to bore rock and its uniaxial compressive strength, it is considered only a rough guide to rock boreability. With the linear cutter method, scaling laws need to be developed if the small scale tests are going to predict field results. Although it is possible in theory to predict tunnel boreability from button indentation tests, other scaling factors need to be considered; including the cutter type, rock type, indexing and penetration dept. (Author Modified Abstract)

PB-216 423/4 PC$4.85/MF$0.95
Alaska Univ., College.
GEOTHERMAL ENERGY.
Final rept.,
Walter J. Hickel. Nov 72, 93p* UA-NSF-GE-72
Grant NSF-GA-34313

Report of the Geothermal Resources Research Conference, Battelle Seattle Research Center, Seattle, Wash., 18-20 Sep 72.

Descriptors: (*Geothermal prospection, Research program administration), Natural resources, Budgeting, Reservoir engineering, Reserves, Production management, Utilization, Environmental surveys, Electric power generation, Energy, Meetings.
Identifiers: *Geothermal energy.

Topics included in the report are: (1) Resource exploration, (2) Resources assessment, (3) Reservoir development and production, (4) Utilization technology, (5) Environmental effects, and (6) Institutional consideration.

8H. Hydrology and Limnology

AD-757 122 Reprint
Lamont-Doherty Geological Observatory Palisades N Y
INTERNAL UNDULAR SURGES IN SENECA LAKE: A NATURAL OCCURRENCE OF SOLITONS.
Journal article,
Kenneth Hunkins, and Myron Fliegel. 16 Oct 72, 12p Rept no. LDGO-1906
Contracts N00014-67-A-0108-0004, N00014-67-A-0108-0016
Revision of report dated 11 Aug 72.
Availability: Pub. in Jnl. of Geophysical Research, v78 n3 p539-548, 20 Jan 73.

Descriptors: (*Lake waves, Motion), Thermoclines, Thermistors, Networks, Density, Periodic variations, Oscillation, Bathythermograph data, Nonlinear systems, New York.
Identifiers: Seneca Lake, *Internal waves, Solitons, Korteweg-de Vries equation.

A thermistor array was monitored at barge sites in Seneca Lake for four seasons. During summer and fall when the lake is well stratified internal surges are often observed traveling from south to north. The isotherms are as much as 20 meters deeper after the surge, which travels at a speed of 35 to 40 cm/sec. A wave train with two distinctive parts characterizes these surges. First there are a number of spatially coherent pulses with broad peaks and sharp troughs that are followed by a lower-amplitude wave train that is less coherent. The initial pulses are interpreted as the solitons of nonlinear wave theory. The trailing waves are the oscillatory tail also predicted by theory. Recent results by others have elucidated the generation and propagation of waves that have large amplitudes but that do not break. The numerical calculations for these waves explain aspects of the internal surges in Seneca Lake. (Author)

BNWL-1692 PC$3.00/MF$0.95
Battelle Pacific Northwest Labs., Richland, Wash.
MISSOURI RIVER HYDROLOGY (STREAMFLOW AND TEMPERATURE)- SIOUX CITY, IOWA TO RULO, NEBRASKA.
D. L. Schreiber. Oct 72, 35p
Contract AT (45-1)-1830

Descriptors: *Missouri river.

For abstract, see NSA 27 06, number 14353.

COM-73-10298 Mag Tape $97.50
National Weather Service, Silver Spring, Md. Office of Hydrology.
NATIONAL WEATHER SERVICE RIVER FORECAST SYSTEM, FORECAST PROCEDURES - PROGRAMS AND TEST DATA.
Dec 72, 1 reel mag tape* NWS-RFS-12-72 CPG-73-0054
The computer programs are described in Rept. no. NOAA-TM-NWS-HYDRO-14, COM-73-10365.
Specify tape recording mode desired: 7 track, 556 and 800 BPI, odd and even parity; or 9 track, 800 BPI, odd parity.

Descriptors: (*Stream flow, Forecasting), (*Rivers, Forecasting), (*Computer programs, Magnetic tapes), Weather forecasting, Data processing, FORTRAN.
Identifiers: FORTRAN 4 programming, language, CDC 6600 computers.

A magnetic tape containing computer programs for the efficient implementation of a conceptual hydrologic model for river forecasting is provided. These programs are described in: National Weather Service River Forecast System, Forecast Procedures, NOAA Technical Memorandum NWS HYDRO-14, U.S. Department of Commerce, Silver Spring, Md., Dec., 1972. Test data are also included on the magnetic tape. There are eight programs written in the FORTRAN 4 language and nine sets of test data. Five programs are used for data processing and data manipulation. Model calibration, historical hydrograph simulation, and operational river flow forecasting programs are included. There are 17 files comprised of 12360 card images (records) on the magnetic tape. The computer programs are written for CDC 6600 computer. (Author Modified Abstract)

COM-73-10365 PC$12.00/MF$0.95
National Weather Service, Silver Spring, Md. Office of Hydrology.
NATIONAL WEATHER SERVICE RIVER FORECAST SYSTEM FORECAST PROCEDURES.
Technical memo.
Dec 72, 257p* NOAA-TM-NWS-HYDRO-14
See also COM-73-10298.

Descriptors: (*Flood forecasting, *Computer programs), River basins, Rainfall, Weather forecasting, Mathematical prediction, Periodic variations, Evapotranspiration, Data processing.

The report serves the following purposes: A guide for implementation of conceptual river forecasting models by field offices; A tool for use in testing and evaluating new concepts and procedures by the Hydrologic Research Laboratory, and A vehicle for providing the results to others in the hydrologic community. The report describes the package which includes the techniques and programs needed for developing operational river forecasts based on the use of a continuous conceptual model, from the initial processing of basin data to the preparation of forecasts. The programs are written for a large-capacity digital computer and are generalized for use on any river system. Thus, they may or may not be the most efficient programs for use in a particular situation. (Author Modified Abstract)

COM-73-10390 PC$3.00/MF$0.95
Geological Survey, Albuquerque, N. Mex.
GROUND-WATER RESOURCES OF THE MORA RIVER DRAINAGE BASIN WITHIN MORA COUNTY, NEW MEXICO.
Open-file rept.,
J. W. Mercer, and E. G. Lappala. Mar 71, 177p
FCRC-TA-391-312-004

Descriptors: (*Ground water, *Mora River Basin), (*Irrigation, New Mexico), Water conservation, Watersheds, Water resources, Water quality, Hydrogeology, Aquifers, Stratigraphy, Economic development.
Identifiers: Mora County (New Mexico).

The report presents the results of an investigation of the ground-water resources of the Mora River drainage in western Mora County, New Mexico. The investigation was endorsed by the steering Committee of the Adelante Resources Conservation and Development Project, an organization formed by the people in the area to encourage development of the resources of Mora County. The investigation is a cooperative effort of the U.S. Soil Conservation Service, the New Mexico Engineer, and the Four Corners Regional Commission. (Author)

E73-10299 PC$5.50/MF$0.95
Bendix Corp., Ann Arbor, Mich. Aerospace Systems Div.
UTILIZATION OF ERTS-1 DATA TO MONITOR AND CLASSIFY EUTROPHICATION OF INLAND LAKES.
Interim rept. Sep 72-Jan 73.
Philip E. Chase, and V. Elliott Smith. Feb 73, 70p
BSR-4010 NASA-CR130555
Contract NAS5-21810
Prepared in cooperation with Cranbrook Inst. of Science, Bloomfield Hills, Mich. Original contains imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Avenue, Sioux Falls, S. Dak., 58198.

Descriptors: Imagery, Eutrophication, Lakes, Earth resources program, Water color, Multispectral photography.

The author has identified the following significant results. Significant findings are: (1) one acre lakes and one acre islands are detectable; (2) circular lakes of 7.5 acres and greater reach full density; (3) long channels 100 ft wide are detectable; (4) orientation of lakes is independent of scan direction; (5) lake features are observable in enlargements of CCT imagery produced in the Bendix Earth Resources Data Center; (6) a decision surface water outline map is presented that was produced from ERTS-1 CCT. A water color literature review, baseline water quality data of the test lakes, and a discussion of geometric corrections of the CCT decision water surface outline map are also presented.

E73-10318 PC$3.00/MF$0.95
Geological Survey, Lakewood, Colo. Water Resources Div.
DETERMINE THE UTILITY OF ERTS-1 IMAGERY IN THE PREPARATION OF HYDROLOGIC ATLASES OF ARID LAND WATERSHEDS.
Progress rept. 1 Jul-31 Dec 72.
Lynn M. Shown, and J. Robert Owen. 1 Jan 73, 6p
NASA-CR-130736
Contract NASA Order S-70243-AG

Descriptors: Imagery, Hydrology, Watersheds, Arid lands, Catalogs (Publications), Earth resources program, Landforms, Vegetation, Drainage patterns, Aerial photography.

The author has identified the following significant results. The 9x9-inch transparencies from the ERTS-1 system seem to have better contrast in vegetation and drainage features than the 70-mm transparencies. This imagery can be magnified about eight times before it becomes excessively grainy. Imagery in band 7 appears to be the best single band product for viewing landform-water complexes. Band 5 best defines vegetation patterns. Multispectral color-additive viewing would appear to improve the separation of vegetation types where the vegetation exhibits moderate to strong infrared reflectance. Multispectral viewing did not appear to improve relief of drainage channel detail. False-color aerial infrared photographs at a scale of 1:120,000 for the Utah test site are excellent quality and can be magnified as much as 15 times without serious loss of contrast or excessive fuzziness. In desert areas with sparse to moderate shrub cover, the contrast between the soil background and the plant cover is so low that texture cannot be seen, even under high magnification. In areas of higher rainfall during the summer it is possible to descriminate coniferous and deciduous trees, grass, and shrub communities and to identify different rangeland treatment practices.

E73-10327 PC$3.75/MF$0.95
Pennsylvania State Univ., University Park. Office for Remote Sensing of Earth Resources.
INTERDISCIPLINARY APPLICATIONS AND INTERPRETATIONS OF ERTS DATA WITHIN THE SUSQUEHANNA RIVER BASIN; RESOURCES INVENTORY, LAND USE AND POLLUTION.
Progress rept. 1 Dec 72-31 Jan 73,
George J. McMurtry. 2 Mar 73, 31p NASA-CR-130770
Contract NAS5-23133

Descriptors: Susquehanna River Basin (Md-NY-Pa), Geological surveys, Land use, Mines (Excavations), Agriculture, Coal, Strip mining, Earth resources, program, Mapping, Multispectral band scanners, Data acquisition, Data processing.

The author has identified the following significant results. Identification and mapping of three major kinds of coal refuse targets based on spectral signatures in channels four through seven of the ERTS-1 MSS were conducted. Correlation of the placement of the coal refuse targets with an existing map of their location was accomplished. Digital processing of ERTS-1 data permitted identification of stripped areas including ones that are not discernible by visual analysis of ERTS imagery. Combined visual and digital techniques of analyzing ERTS-1 data for geologic formations have been tried on selected areas of Pennsylvania. Mapping of two major agricultural counties to show land forms, drainage patterns, water, and urban areas were made using positive transparencies of MSS data. Two frames of the same central Pennsylvania area were brought into registration by translation and then merged even though the frames were obtained 71 days apart.

E73-10359 PC$3.00/MF$0.95
Agricultural Research Service, Chickasha, Okla.
INVESTIGATION OF USE OF SPACE DATA IN WATERSHED HYDROLOGY.
Progress rept. 10 Jun 72-30 Jan 73,
Bruce J. Blanchard. Mar 73, 12p NASA-CR-130974
Contract NASA Order S-70251-AG
Original contains imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S.D. 57198.

Descriptors: Imagery, Hydrology, Watersheds, Multispectral band scanners, Great Plains Corridor (North America), Earth resources program, Moisture, Data processing, Mathematical models, Water runoff.

The author has identified the following significant results. Ground truth data have been compiled and 256 rainfall runoff events have been used to determine coefficients for two storm runoff equations that apply to the 20 study watersheds. Two scenes have been processed using CCT data. Data pertinent to each of the study watersheds have been excerpted from the tapes. A computer program and display technique has been developed to retrieve the data from irregular shaped areas and store it in a format that allows future display of only the area desired. Means, standard deviations, and distribution have been determined for extreme dry and extreme wet conditions in the dormant season. Mean digital values show some variation between watersheds when dry, but no significant differences when wet. Standard deviations of digital values diminish drastically under wet dormant conditions. Thus the standard deviations may be a good indicator of influence of moisture. Distributions of seven bit values show that odd numbers are prevalent and irregular distribution may influence some classification schemes now in use.

N73-16437 PC$3.50/MF$0.95
Grumman Aerospace Corp., Bethpage, N.Y. Research Dept.
WATER QUALITY DETERMINATIONS IN THE VIRGIN ISLANDS FROM ERTS-A DATA.
W. Egan. Dec 72, 26p NASA-CR-130008, RM-561J
Subm- Sponsored By Nasa

Descriptors: *Caribbean sea, *Earth resources technology satellite a, *Islands, *Water pollution,

*Water quality, Atmospheric composition, Photometry, Spectrophotography.

For abstract, see STAR 11 07.

PB-216 603/1 PC$3.00/MF$0.95
Missouri Water Resources Research Center, Columbia.
DEVELOPMENT OF A METHOD TO DETERMINE ORTHO-, PYRO-, AND TRIPOLY-PHOSPHATE IN SEDIMENT.
Completion rept., 1 Jul 71-31 Oct 72,
R. W. Blanchar, and Domingo Riego. 3 Jan 73, 57p W73-06035, OWRR-B-051-MO (1)
Contract DI-14-31-0001-3605

Descriptors: (*Sediments, *Chemical analysis), (*Inorganic phosphates, Sediments), Solvent extraction, Chromatographic analysis, Errors, Accuracy, Water pollution.
Identifiers: *Pyrophosphates, *Tripolyphosphates.

Phosphate detergents are primarily sodium tripolyphosphates. High analysis phosphates used in liquid fertilizers and some solid fertilizers are composed of orthophosphate, pyrophosphate and tripolyphosphate. Unfortunately, there are no methods available to extract and separate these phosphates when they are contained in sediments. The objective of the report is to present a method for the extraction, separation, and analysis of them. In the method, sediment is extracted with 2% EDTA + 0.1M NH4F followed by a second extract of 2% EDTA + 1N NaOH. Then orthophosphate (OP), PP, and TPP are separated by anion exchange chromotography, and the fractions collected and P determined after extraction into isobutanol. The limit of detection of the method was 0.5 microgram P/g sediment.

PB-216 807/8 PC$3.00/MF$0.95
Minnesota Univ., Minneapolis. Water Resources Research Center.
PREDICTING PEAK FLOW OF SMALL WATERSHEDS BY USE OF CHANNEL CHARACTERISTICS,
Curtis L. Larson, Ronald F. Gronwald, and Alfred G. Pennell. Jun 72, 107p WRRC-Bull-52 W73-06027, OWRR-A-023-MINN (4)

Descriptors: (*Surface water runoff, Forecasting), (*Channel flow, Forecasting), (*Watersheds, Surface water runoff), Hydrology, Stream flow, Hydrography, Time lag, Geometric forms, Mathematical prediction, Profiles, Travel time, Velocity, Hydraulics.
Identifiers: *Storm water runoff, *Peak discharge.

In previous studies, a method was developed for predicting the effects of channel characteristics, including watershed size and shape, on peak flow from small watersheds. The method was incomplete, however, since it lacked a working method of estimating the time parameter for ungaged watersheds. Therefore, the first objective of this study discussed was to satisfy this need. The second objective was to test the overall method as a means of predicting peak flow for small ungaged watersheds, given the runoff volume. (Author Modified Abstract)

PB-216 812/8 PC$3.00/MF$0.95
Missouri Water Resources Research Center, Rolla.
METHODS OF DETERMINING AQUIFER STORAGE CAPACITY AND FRESH-SALINE WATER INTERFACES BY GEOELECTRICAL INVESTIGATIONS.
Completion rept., 1 Jul 71-30 Jun 72,
Reinhard K. Frohlich, and William Head. 15 Dec 72, 41p W73-06033, OWRR-A-046-MO (1)
Contract DI-14-31-0001-3525

Descriptors: (*Aquifers, Water storage), (*Ground water, Electrical resistivity), Interfaces, Resistivity exploration, Drilling, Clays, Gravel, Depth sounding, Fresh water, Water wells, Missouri.
Identifiers: Grundy County (Missouri).

Geoelectrical investigations in Grundy County of northwestern Missouri where the groundwater resources of the glacial deposits have already been examined through an extensive drilling program by the Missouri Geological Survey and Water Resources, indicate that water-bearing gravel deposits can be distinguished from glacial deposits containing appreciable amounts of clay and limited amounts of water. The Schlumberger method used for the geoelectric depth soundings in the vicinity of the Survey's drillholes demonstrates the exploratory usefulness of the method in that it can partly replace the more expensive procedure of drilling. The method also provides improved interpretation between drillholes. Results of the investigation show that, in the area, clay has a resistivity below 20 ohm m, that the fresh water-bearing gravel at the bottom of the buried glacial stream channels has a resistivity of 40 to 50 ohm m, and that the near surface glacial gravel deposits have a resistivity above 100 ohm m. (Author Modified Abstract)

PB-216 813/6 PC$3.00/MF$0.95
Missouri Water Resources Research Center, Rolla.
THE DETECTION AND MAPPING OF SUBTERRANEAN WATER BEARING CHANNELS.
Completion rept.,
R. D. Rechtien, and L. W. Gardner. Dec 72, 18p W73-06034, OWRR-A-051-MO (1)

Descriptors: (*Underground streams, Detection), (*Seismic prospecting, Underground streams), Seismic reflection method, Ground water, Hydrogeology, Resonance, Cavities, Vibration.

Results are presented of an experiment designed to determine the vibrational characteristics of subterranean voids. The objective was to evaluate the resonance phenomenon, as reported by early investigations, as an an appropriate mechanism for the development of a cavity detection and delineation tool. The results, while not entirely establishing the existence of resonance per se, establish a diagnostic reverberant seismic event that shows much promise as a detection mechanism. The use of three-component seismometers, and particle trajectory analysis, restores practicality to the reflection method. (Author Modified Abstract)

PB-216 814/4 PC$3.00/MF$0.95
Missouri Water Resources Research Center, Rolla.
INVESTIGATION OF PRESENT THERMAL REGIME OF MISSOURI RIVER IN MISSOURI.
Completion rept., 1 Jul 70-31 Jan 72,
James C. Maxwell. 27 Dec 72, 115p W73-06036, OWRR-B-045-MO (1)
Contract DI-14-31-0001-3299

Descriptors: (*Rivers, Mathematical models), (*Missouri River, Thermal analysis), (*Stream pollution, Mathematical models), Fourier analysis, Regression analysis, Power series, Spectral energy distribution, Temperature, Forecasting, Frequency distribution, Cooling water, Water pollution.
Identifiers: *Thermal pollution.

A need has been established for the use of both deterministic and probabilistic techniques in the development of prediction models for river water temperatures. A corresponding need exists for similar techniques in the estimation of man-made thermal inputs to large rivers primarily as a result of projected large increases in nuclear and fossil-fuel production of electrical power. Thus the report demonstrates the applicability of power spectral density techniques, Fourier series analysis, and linear regression to the mathematical modeling of river water temperature. Consideration is also given to the problem of estimating thermal inputs. A predictive model, based on the above analysis methods, is proposed.

8I. Mining Engineering

AD-757 114 PC$4.50/MF$0.95
Rapidex Inc Boxford Mass
STUDY OF A CONTINUOUS DRILL AND BLAST TUNNELING CONCEPT.
Final rept. 17 Aug 72-6 Feb 73,
Carl R. Peterson. Mar 73, 59p*
Contract H0230008, ARPA Order-1579

Descriptors: (*Rock (Geology), Drilling), Automation, Drilling machines, Explosive materials, Explosives initiators, Ventilation, Underground structures, Construction.
Identifiers: Rapid excavation, Tunneling, Mucking.

A spiral drilling pattern is described which offers high efficiency drill and blast tunneling via frequent small blasts rather then the occasional large blasts of conventional practice. Preliminary design work is presented for a combined drilling, loading, shooting, and mucking machine which would stay at the tunnel face, providing continuous drill and blast progress. Advance rates in excess of 13 feet per hour in an 8 x 8 foot horseshoe tunnel are predicted using off-the-shelf (except for automated explosive loading and initiation) components. (Author)

COM-73-10405 Reprint
Wisconsin Univ., Madison. Sea Grant Program.
UNDERWATER MINING - INSIGHT INTO CURRENT U.S. THINKING,
Peter A. Smith. 1972, 7p WIS-SG-72-330
NOAA-73020801
Pub. in Mining Magazine, p44-49 Jul 72.

Descriptors: (*Mining, *Undersea mineral deposits), Ocean bottom, Natural resources, Manganese nodules, Hydrochlorination, Barite, Alaska, Maine, Copper ores, Zinc ores, Offshore drilling, Philippines, Neutron activation analysis, Benefit cost analysis, Placer mining, Systems engineering, Dredging.

A review is made of papers presented at the Third Underwater Mining Institute held at the University of Wisconsin in 1972. A function of the institute was to bring together key speakers from the ocean minerals industry, international law, and applied exploration fields to focus attention upon developments in a young but viable part of the mining industry.

COM-73-10407 PC$3.00/MF$0.95
California Univ., San Diego, La Jolla. Inst. of Marine Resources.
SEA FLOOR WORK ECONOMICS.
Preliminary rept.,
Edward Dangler. 1973, 38p UC-IMR-73-8 SIO-Sea Grant Pub-25, NOAA-73021304
Contract NOAA-2-35208

Descriptors: (*Underwater environments, *Economic analysis), (*Underwater construction, Ocean bottom), Evaluation, Methodology, Cost effectiveness, Factor analysis, Reviews, Bibliographies.

The report explains the approach used in the formulation and selection of an evaluation methodology for sea floor work economics. After describing the task performance matrix, a breakdown of major cost factors is provided. One section deals with the mechanics of determining the specific and relative cost-effectiveness of a system to perform a given task, or a generalized operational function. Another presents the tasks necessary to gather, organize and structure cost and performance data in evaluation models for economic analysis of candidate sea floor systems. A sea floor work system related bibliography is included.

DOCKET-406622-5 PC$3.00/MF$0.95
Utah International, Inc., San Francisco, Calif.

SHIRLEY BASIN URANIUM MINE. SUPPLEMENTAL ENVIRONMENTAL INFORMATION.
12 Jan 73, 20p

Descriptors: *Environment, *Uranium ore processing plants.

For abstract, see NSA 27 06, number 11779.

PB-215 813/7 PC$3.00/MF$0.95
Bureau of Mines, Washington, D.C.
A STUDY OF FRAGMENTATION FROM BENCH BLASTING IN LIMESTONE AT A REDUCED SCALE.
Rept. of investigations,
Richard A. Dick, Larry R. Fletcher, and Dennis V. D'Andrea. Jan 73, 29p BuMines-RI-7704
Prepared in cooperation with Twin Cities Mining Research Center, Minn.

Descriptors: (*Limestone, Quarrying), (*Excavation, Limestone), Blast effects, Explosive charges, Boreholes, Fragmentation, Drilling, Experimental design, Size separation, Minnesota.
Identifiers: Stewartville (Minnesota).

Eight blasts were fired in a 2-1/2-ft bench in the Stewartville member of the Galena Limestone formation in an aggregate quarry near Stewartville, Minn. The shots were dimensionally proportional to production-size bench blasts, and were about 5 to 10 percent of full scale. The effects of site, timing of initiation, and burden-to-spacing ratio were studied in a 2 x 2 x 2 factorial experiment, using three boreholes, each containing a 1/2-inch-diameter charge of high density ammonia dynamite, in each blast. Detonation velocity measurements indicated that the dynamite detonated satisfactorily in the 1/2-inch charge diameter. The effects of the three experimental variables were analyzed for the percentage, by weight, of oversized material produced and for size distributions determined by screening the entire muckpile. (Author Modified Abstract)

PB-215 816/0 PC$3.00/MF$0.95
Bureau of Mines, Washington, D.C.
ANALYSIS OF THE GEOMETRY OF FRACTURES IN SAN MANUEL COPPER MINE, ARIZONA.
Rept. of investigations,
M. A. Mahtab, D. D. Bolstad, and F. S. Kendorski. Jan 73, 29p BuMines-RI-7715
Prepared in cooperation with Denver Mining Research Center, Colo.

Descriptors: (*Mines (Excavations), Fracture zones), Copper ore deposits, Sampling, Apertures, Spacing, Quartz, Rhyolite, Conglomerate rocks, Geological faults, Arizona.
Identifiers: San Manuel Copper Mine.

The report quantifies the geometric parameters (attitude, spacing, extent, and aperture) of fracture patterns in a selected portion (study area) of San Manuel Copper Mine, Arizona. Three prominent and nearly orthogonal sets of fracture orientations were delineated. Sets 1 and 2 dip nearly vertically, and generally strike E-W and N-S, respectively, whereas Set 3 is nearly horizontal. Comparison of the three rock types present in the study area (that is, quartz monzonite, monzonite porphyry, and rhyolite) shows that the rhyolite fractures have short extent, small spacing, and tight apertures. (Author Modified Abstract)

8J. Physical Oceanography

AD-757 067 PC$3.00/MF$0.95
Scripps Institution of Oceanography La Jolla Calif
TEMPERATURE DATA FROM THE PACIFIC AND INDIAN ABYSSAL WATERS - (FROM THE CIRCLE, SCAN AND SEVEN-TOW EXPEDITIONS),
Y. Chung, C. Down, and J. G. Sclater. 1972, 49p
Rept no. SIO-Ref-72-85
Contract N00014-69-A-0200-6006, Grant NSF-GA-29159X

Descriptors: (*Oceanographic data, *Pacific Ocean), (*Indian Ocean, Oceanographic data), Sea water, Temperature, Deep water.
Identifiers: Abyssal zone, Temperature measurement.

The report is a continuous data report to the 'Temperature Data from the Pacific Abyssal Water', a data report published by the Scripps Institution of Oceanography (Reference 69-17). The abyssal water temperature data covered in this report were accumulated during heat-flow measurements from three Scripps expeditions: the CIRCE, SCAN and SEVEN-TOW. (Author Modified Abstract)

AD-757 098 PC$6.00/MF$0.95
Massachusetts Inst of Tech Cambridge Dept of Meteorology
AN INSTRUMENT FOR MEASURING DEEP OCEAN PRESSURE FLUCTUATIONS.
Final rept.,
Albert Meyer Bradley. 17 Jan 73, 172p* Rept no. 73-1
Contract N00014-67-A-0204-0048
Doctoral thesis.

Descriptors: (*Oceanographic equipment, Pressure gages), Piezoelectric gages, Deep water, Hydrostatic pressure, Telemeter systems, Tides, Microseisms, Ocean waves, Test methods, Calibration, Integrated circuits, Theses.
Identifiers: Internal waves.

The report describes the design, construction, and testing of a system to measure deep ocean pressure fluctuations. The system is based on a new type of pressure transducer, the quartz crystal resonator pressure sensor, which appeared particularly well adapted for use in the deep ocean. (Author Modified Abstract)

AD-757 103 PC$3.00/MF$0.95
Aerophysics Research Corp Bellevue Wash
ARCTIC SITE SURVEY, PART I,
T. S. Chow. 15 Mar 73, 94p
Contract N00014-72-C-0335, ARPA Order-1779
See also report dated 7 Nov 72, AD-752 056, AD-757104, and AD-757 105.

Descriptors: (*Underwater sound, *Arctic Ocean), Ocean bottom topography, Differential equations, Sound transmission, Absorption, Sea ice, Reflection, Roughness, Depth finding, Underwater sound equipment, Naval research.
Identifiers: Underwater sound transmission, Ray tracing, Bathymetry, Computer aided analysis.

The principal objectives of this work are: to investigate ray theory normal mode or any newly-developed method by comparing the computed results with field measured data for predicting underwater sound propagation loss in the Arctic, and to apply appropriate techniques to evaluate acoustic intensity and transmission loss at promising locations from a number of sound sources in the Arctic. Topics discussed in the report include the following: Theoretical developments; The Arctic Ocean environment for underester acoustics studies; Application of ray acoustics in the Arctic; Computed results and plots.

AD-757 104 PC$3.00/MF$0.95
Aerophysics Research Corp Bellevue Wash
ARCTIC SITE SURVEY. PART II,
T. S. Chow. 15 Mar 73, 85p
Contract N00014-72-C-0335, ARPA Order-1779
See also AD-757 103, and AD-757 105.

Descriptors: (*Underwater sound transmission.

The computer output of acoustic intensities and underwater sound transmission losses is given in tables for locations in the Arctic Ocean.

AD-757 105 PC$3.00/MF$0.95
Aerophysics Research Corp Bellevue Wash

ARCTIC SITE SURVEY. PART II, CONTINUED,
T. S. Chow. 15 Mar 73, 69p
N00014-72-C-0335, ARPA Order-1779
See also AD-757 104 and AD-757 103.

Descriptors: (*Underwater sound, *Arctic Ocean), Sound transmission, Ocean bottom, Intensity, Attenuation, Ranges (Distance), Tables, Naval research.
Identifiers: Underwater sound transmission.

The report continues the computer output of acoustic intensities and underwater sound transmission losses for locations in the Arctic Ocean.

AD-757 321 PC$3.00/MF$0.95
Naval Underwater Systems Center Newport R I
PROJECT KIWI ONE CRUISE REPORT.
Summary rept. 4 Apr-12 Jun 72,
William H. Thorp, and William R. Schumacher. 12 Feb 73, 34p Rept no. NUSC-TD-4455

Descriptors: (*Underwater sound, Scientific research), Oceanographic equipment, Buoys, Marine biology, Sound transmission, Scattering, Atlantic Ocean, Pacific Ocean, Caribbean Sea, Mexico Gulf.
Identifiers: KIWI ONE project, North Atlantic Ocean, South Pacific Ocean.

The document contains a chronology of the biological and underwater acoustic tests during Project KIWI ONE, between 4 April and 12 June 1972, in areas of the North Atlantic and South Pacific Oceans, the Gulf of Mexico, and the Caribbean Sea. Objectives, problems, and accomplishments relative to the four separate phases and the planned events of each are described. (Author)

AD-757 332 PC$3.00/MF$0.95
Naval Ordnance Lab White Oak Md
DEEP OCEAN OPTICAL MEASUREMENT (DOOM) REPORT: BAHAMA CHANNELS AND NORTH-WESTERN ATLANTIC OCEAN.
Interim rept.,
Donald E. Matlack. 20 Nov 72, 66p Rept no. NOLTR-72-284

Descriptors: (*Sea water, Optical properties), (*Underwater light, Attenuation), Light transmission, Scattering, Temperature, Atlantic Ocean, Tables.
Identifiers: DOOM (Deep Ocean Optical Measurement), Deep ocean optical measurements, DOOM program, Sargasso Sea.

In situ optical attenuation data obtained during Deep Ocean Optical Measurement (DOOM) program cruises D and E in 1969 are presented. Locales of operation were for Cruise D the Florida Straits and the Providence channels of the Bahama Islands and for Cruise E the western Atlantic from a coastal area off the Virginia Capes to the waters of the Sargasso Sea 300 nautical miles east of the Bahamas. Optical data presented are surface to bottom measurements of spectral attenuation coefficients at visible wavelengths in the transmission window interval and the volume scattering function at a wavelength of 436 nanometers. Subsequent measurement cruises are briefly discussed and DOOM program progress is updated. (Author)

AD-757 455 PC$3.00/MF$0.95
Saclant ASW Research Centre La Spezia (Italy)
GEOPHYSICAL CHARTS OF THE MEDITERRANEAN SEA,
Thomas D. Allan, and Carlo Morelli. 1 Feb 73, 8p
Rept no. SACLANTCEN-SM-2

Descriptors: (*Marine geophysics, *Mediterranean Sea), Navigation charts, Hydrographic surveying, Gravity, Anomalies, Terrestrial magnetism, Depth finding, Echo ranging.
Identifiers: Geophysical surveys, Bathymetry, Gravity anomalies, Magnetic anomalies.

An 80,000 n.mi geophysical survey of the whole of the Western Mediterranean, the Aegean, and the area sourth of Crete is presented on 1:750 000 charts of contoured bathymetry, free-air gravity anomalies, simple Bouguer anomalies and total magnetic intensity. The thirty-six charts are available rolled, with a short narrative. References to a longer explanatory test are given. (Author)

AD-757 699 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
SOUND PHASE AND AMPLITUDE FLUCTUATIONS IN AN ANISOTROPIC OCEAN.
Master's thesis,
Charles Homer Alexander. Dec 72, 255p

Descriptors: (*Underwater sound, Intensity), Sea water, Thermoclines, Statistical functions, Power spectra, Frequency, Underwater sound equipment, Microstructure, Theses, Naval research, Computer programs, Phase measurement.
Identifiers: Autocorrelation, Spectrum analysis.

Sound of constant amplitude and frequency was transmitted simultaneously in three orthogonal beams over a distance of 1.5 meters in the upper ocean. Time records of the resulting phase and amplitude fluctuations of the sound beams were studied by means of auto and cross spectral analysis and correlation. The time lag between corresponding peaks of the phase fluctuation autocorrelation functions of vertical and horizontal beams indicate movement of inhomogeneities between the sound fields due to water particle motion caused by surface wave action. Envelope correlation times of the phase fluctuations are found to be approximately one-half as great in the mixed layer as in the thermocline, and are greater in the vertical than in the horizontal direction in the thermocline. Anisotropy in the thermocline is also indicated by the variance of phase fluctuation being greater for sound paths in the horizontal than in the vertical direction. The autocorrelation functions of amplitude and phase fluctuations in any one direction are similar. (Author)

AD-757 700 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
A STUDY OF NUTRIENT VARIATIONS IN THE SURFACE AND MIXED LAYER OF MONTEREY BAY USING AUTOMATIC ANALYSIS TECHNIQUES.
Master's thesis,
Gaylord Oneil Paulson. Sep 72, 157p

Descriptors: (*Sea water, Colorimetric analysis), (*Pacific Ocean, *Colorimetric analysis), California, Design, Performance (Engineering), Concentration (Chemistry), Errors, Theses, Silicates, Phosphates, Nitrates, Nitrites.
Identifiers: *Monterey Bay, *Nutrients, Algal blooms, Chemical composition, Upwelling, Circulation, Water analysis.

Concentrations of silicate, phosphate, nitrate, and nitrite were determined in Monterey Bay, California. Data were collected aboard ship during four cruises in April and May 1972 using the Technicon AutoAnalyzer II System in dual channel operation. The sensitivity, reproducibility, and accuracy of this system were investigated and the results presented. Nutrient concentrations were presented as surface variations, depth variations, and vertical profiles. The large variability of nutrient concentrations in the ocean area studied was discussed. Upwelling areas were investigated for nutrient concentrations, circulation patterns, and variations in nutrient ratios. Planktonic bloom areas have been identified. (Author Modified Abstract)

TT-70-57237 PC$6.00/MF$0.95
National Oceanic and Atmospheric Administration, Rockville, Md.
PROBLEMS OF SEA CHEMISTRY (PROBLEMY KHIMII MORYA),
V. N. Nikitin. 1972, 448p
Contract NSF-C-466
Trans. of Akademiya Nauk SSSR. Institut Okeanologii. Trudy, V42, 272p 1960. Sponsored in part by National Science Foundation, Washington, D. C. Special Foreign Currency Science Information Program.

Descriptors: (*Sediments, *Geochemistry), Pacific Ocean, Bering Sea, New Zealand, Okhotsk Sea, White Sea, Black Sea, Sulfates, Sea water, Salinity, Sedimentology, Translations, USSR.

Contents:
- Chemistry of sediments of the Northwestern Pacific Ocean;
- Organic matter in recent sediments of the Bering Sea;
- Chemistry of sediments from the Central Pacific Ocean;
- Types of sulfur compounds in bottom sediments of the Pacific Ocean near New Zealand;
- Hydrochemical characteristics of the Okhotsk Sea;
- Hydrochemical investigations of the White Sea;
- Water and salinity equilibrium of the Black Sea.

8K. Seismology

AD-757 277 PC-GPO/MF$0.95-NTIS
National Oceanic and Atmospheric Administration Boulder Colo Earth Sciences Labs
HIGH-GAIN, LONG-PERIOD SEISMOGRAPH STATION INSTALLATION REPORT, ALBUQUERQUE, NEW MEXICO,
John P. Hoffman. Dec 72, 53p Rept no. NOAA-TR-ERL-249-ESL-24
ARPA Order-1513-5
Availability: Paper copy available from GPO $0.80 as C55.12:ERL-249-ESL-24.

Descriptors: (*Seismological stations, New Mexico), Underground structures, Seismometers.
Identifiers: Albuquerque (New Mexico), Long period seismometers.

A High-Gain, Long-Period Seismograph System, developed by the Lamont-Doherty Geological Observatory, was installed at the Albuquerque Seismological Center Observatory near Albuquerque, New Mexico, in August 1971. Magnification in excess of 100,000 for the vertical component at periods of 35 to 45 sec have been obtained. Horizontal components operate at about one half the gain of the certical component. The data are recorded both digitally and photographically. (Author)

AD-757 292 Reprint
Lamont-Doherty Geological Observatory Palisades N Y
P AND S TRAVELTIMES IN THE TONGA-FIJI REGION: A ZONE OF LOW VELOCITY IN THE UPPERMOST MANTLE BEHIND THE TONGA ISLAND ARC,
Yash Pal Aggarwal, Muawia Barazangi, and Bryan Isacks. 28 Dec 72, 14p Rept nos. LDGO-1877, Scientific-5 AFCRL-TR-73-0067
Contract F19628-71-C-0245, ARPA Order-1795
Prepared in cooperation with Cornell Univ., Ithaca.
Availability: Pub. in Jnl. of Geophysical Research, v77 n32 p6427-6434, 10 Nov 72.

Descriptors: (*Seismic waves, Velocity), Anomalies, Lithosphere, Attenuation, Epicenter, Microseisms, Reflection, Refraction, Seismology, Pacific Ocean Islands.
Identifiers: Earth mantle.

The principal purpose of this study is to report the existence of a zone of extremely low compressional-wave velocities in the uppermost mantle beneath most of the Lau basin, an interarc basin located west of or behind the Tonga Island arc. Velocities beneath the basin appear to be as low as 7.1 km/sec. In contrast, times of P and S waves traveling beneath and parallel to the Tonga-Kermadec ridge indicate velocities of 8.45 and 4.75 km/sec, respectively. Although the lateral boundaries of the zone of low velocity beneath the Lau basin are not well defined, they coincide approximately with the boundaries of the zone of high seismic-wave attenuation existing beneath the Lau basin. The large difference (up to 15 percent) between P wave velocities beneath the Lau basin and those in areas adjacent to it probably requires partial melting in the upper mantle beneath the Lau basin. The P and S velocities measured parallel and approximately perpendicular to the Tonga trench do not differ significantly and hence provide no evidence for anisotropy in the Pacific lithosphere. (Author)

AD-757 293 Reprint
Lamont-Doherty Geological Observatory Palisades N Y
SEISMIC WAVE REFLECTED FROM VELOCITY GRADIENT ANOMALIES WITHIN THE EARTH'S UPPER MANTLE,
Paul G. Richards. 28 Dec 72, 16p Rept nos. LDGO-1784, Scientific-4 AFCRL-TR-73-0066
Contract F19628-71-C-0245, ARPA Order-1795
Availability: Pub. in Zeitschrift fur Geophysik, v38 p517-527 Sep 72.

Descriptors: (*Seismic waves, Reflection), Anomalies, Structural geology, Thickness, Velocity.
Identifiers: Earth mantle.

Classical Thomson-Haskell methods have recently been extended, to obtain the asymptotic wave solution in a stratified elastic medium which has both first and second order discontinuities in the elastic parameters. These methods are used here in a discussion of the observed precursors to seismic waves P'P'. The frequency-dependent reflection coefficient R (=reflected/incident displacement amplitudes) is calculated for several models of transition regions in the Earth's mantle. To generate observable precursors to P'P', by reflection from horizontal layering within the mantle, the thickness L of the region of transition is shown to be much smaller than has generally been supposed. This result follows from the rapid decrease in R as the transition thickness increases from zero to one wavelength. For example, R (1 second) > 2 1/2 percent only if L < 4 km., even in cases of 10 percent total changes in velocity. (Author)

AD-757 508 PC$3.00/MF$0.95
Massachusetts Inst of Tech Cambridge Dept of Earth and Planetary Sciences
POST-DOCTORAL RESEARCH IN SEISMOLOGY.
Annual rept. 1 Jul 71-30 Jun 72,
Frank Press, M. Nafi Tokosoz, and D. J. Andrews. 27 Nov 72, 46p AFOSR-TR-73-0484
Contract AF 49 (638)-1763, ARPA Order-1827-3
See also report dated 31 Dec 71, AD-746 031.

Descriptors: (*Seismology, Scientific research), (*Underground explosions, Detection), (*Structural geology, Lithosphere), Nuclear explosions, Earthquakes, Ocean bottom topography, Marine geology, Rock (Geology), Mathematical models, Simulation, Viscoelasticity.
Identifiers: LASA (Large Aperture Seismic Array), Large aperture seismic array, Gasbuggy shot, Earth crust, Ocean bottom spreading.

Observations and theoretical models were carried out to study source properties of earthquakes and explosions and structure and dynamics of the crust and upper mantle. Earthquake sources and the structure of the crust have been studied using seismic travel times and spectral ratios. Nonlinear propagation of waves from underground explosions has been studied numerically. Numerical methods for tectonic flow have been developed and applied to the dynamics of mid-ocean ridges. (Author)

AD-757 519 PC$3.00/MF$0.95
Massachusetts Inst of Tech Cambridge Dept of Earth and Planetary Sciences
RESEARCH IN SEISMOLOGY.
Annual rept. 1 Apr 71-31 Mar 72,
Frank Press, M. Nafi Toksoz, Keiiti Aki, and Sean C. Solomon. 15 Sep 72, 244p AFOSR-TR-73-0491
Contract F44620-71-C-0049, ARPA Order-1827-1

Descriptors: (*Seismology, Reports), (*Structural geology, Seismic waves), Earthquakes, Nuclear explosions, Underground explosions, Lithosphere, Earth models, Stresses, Anomalies, Power spectra, Theses, Faults (Geology), Reviews.
Identifiers: Earth mantle, Surface waves.

The report gives a summary of the research projects conducted under this contract. These investigations can be grouped into three broad categories: (1) Wave propagation in laterally inhomogeneous media, including studies of body waves, surface waves and free oscillations; (2) Source mechanisms of earthquakes and underground nuclear explosions, including questions of the scaling of earthquake spectra, the tidal triggering of earthquakes, and the release of tectonic strain by explosions; (3) Earth structure, with primary emphasis on developing realistic models for seismic-wave attenuation in the upper mantle and for stress within downgoing slabs of lithosphere. Lists of publications and theses completed during the contract year are also included. (Author)

COM-73-10399 PC$3.00/MF$0.95
National Oceanic and Atmospheric Administration, Las Vegas, Nev. Earth Sciences Labs.
A PRELIMINARY SEISMICITY STUDY OF THE SOUTHERN NEVADA REGION FOR THE MONTH OF JULY 1972.
Technical memo.,
Kenneth C. Bayer. Oct 72, 23p NOAA-TM-ERL-ESL-21 NOAA-73020904
Contract AT (29-2)-746

Descriptors: (*Seismological stations, *Nevada), (*Earthquakes, Measurement), Seismic epicenter, Seismic detection, Maps, Tables (Data).

A cooperative network of 21 seismic velocity sensitive stations is operated in the southern Nevada area; the stations are monitored by the NOAA/ESL Nevada Special Projects Party located in Las Vegas, Nevada. There was no significant earthquake pattern that developed during the month of July 1972. Two seismicity maps are included; one of the southern Nevada region and the second of the seismicity on the Nevada Test Site (NTS). This is the initial monthly seismic bulletin in which the entire data analysis (including the computer programming) has been accomplished in Las Vegas by the Nevada Special Projects Party. The output is listed in the Hypocenter Summary. The listing is the result of data scaled only from the local network and solutions determined by a local epicenter program. A total of 47 epicenters is listed. (Author)

8L. Snow, Ice, and Permafrost

AD-757 270 PC$3.00/MF$0.95
Colorado Univ Boulder Inst of Arctic and Alpine Research
PRESENT AND PALEO-CLIMATIC INFLUENCES ON THE GLACIERIZATION AND DEGLACIERIZATION OF CUMBERLAND PENINSULA, BAFFIN ISLAND, N.W.T., CANADA.
Final technical rept. 1969-Oct 72,
John T. Andrews, and Roger G. Barry. Oct 72, 230p Rept no. INSTAAR-OCCASIONAL PAPER-2 AROD-8000:15-EN
Grants DA-ARO (D)-31-124-G1163, DA-ARO-D-31-124-70-G80
Errata sheet inserted.

Descriptors: (*Glaciers, *Baffin Island), (*Climatology, Baffin Island), Geological survey, Terrain, Meteorological parameters.
Identifiers: *Paleoclimatology.

The purpose of the research discussed in this report was to attempt an integrated analysis of the past and present climates of the northern Cumberland Peninsula region with specific attention focused on the links between glacier distribution and fluctuations and the climate. The final objective of the research is to attempt to model the paleoclimate of the region during the late Quaternary.

AD-757 582 Not available NTIS
Atmospheric Environment Service Toronto (Ontario)
EVALUATION OF NORTH WATER SPRING ICE COVER FROM SATELLITE PHOTOGRAPHS,
P. G. Aber, and E. Vowinckel. 1972, 10p
Availability: Pub. in ARCTIC, Jnl. of the Arctic Institute of North America, v25 n4 p263-271 Dec 72.

Descriptors: (*Sea ice, Arctic regions), Aerial photographs, Meteorological satellites, Photointerpretation, Cloud cover, Melting, Freezing, Thickness, Canada.
Identifiers: Spaceborne photography.

Satellite photographs for 2 years (March-September) have been used to study ice cover in the polynia called 'North Water', and to determine whether reliable ice maps could be made from satellite data without computer analysis. After early July the clouds become opaque and distinction between cloud and ice is impossible. It was concluded that ice distribution for short periods could best be obtained by careful photograph interpretation. The most persistent open water is found at the northern edge, at about 78 degrees N. The southern ice edge is diffuse. The changes in ice cover in the North are mainly caused by freezing and melting, whereas ice transport is important in the southern area. (Author)

E73-10345 PC$3.75/MF$0.95
Earth Satellite Corp., Washington, D.C.
FACILITATING THE EXPLOITATION OF ERTS IMAGERY USING SNOW ENHANCEMENT TECHNIQUES.
Bimonthly progress rept. 1 Jan-28 Feb 73,
Frank J. Wobber, Kenneth Martin, and Roger Amato. 1 Mar 73, 35p NASA-CR-130804
Contract NAS5-21744
Original contains imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S.D., 57198.

Descriptors: Snow cover, Imagery, New England (U.S.), Structural properties (Geology), Land use, Earth resources program, Photointerpretation, Geological faults, Drainage patterns, Lithology.

The author has identified the following significant results. New fracture detail within the New England test area has been interpreted from ERTS-1 images. Comparative analysis of snow-free imagery (1096-15065 and 1096-15072) has demonstrated that MSS bands 5 and 7 supply the greatest amount of geological fracture detail. Interpretation of the first snow-covered ERTS-1 images (1132-15074 and 1168-15065) in correlation with ground snow depth data indicates that a heavy blanket of snow (>9 inches) accentuates major structural features while a light dusting (<1 inch) accentuates more subtle topographic expressions. Snow cover was found to accentuate drainage patterns which are indicative of lithological and/or structural variations. Snow cover provided added enhancement for viewing and detecting topographically expressed fractures and faults. A recent field investigation was conducted within the New England test area to field check lineaments observed from analysis of ERTS-1 imagery, collect snow depth readings, and obtain structural joint readings at key locations in the test area.

N73-16412 PC$17.75/MF$0.95
Department of the Environment, Ottawa (Ontario). Ice and Snow Research Committee.
REVIEW OF CURRENT ICE TECHNOLOGY AND EVALUATION OF RESEARCH PRIORITIES.
1971, 312p REPT-17

Descriptors: *Canada, *Economic factors, *Ice, *Priorities, *Research management, Ecology, Management planning, Surface navigation, Transportation.

For abstract, see STAR 11 07.

8M. Soil Mechanics

AD-757 516 PC$3.00/MF$0.95
Kentucky Univ Lexington Dept of Civil Engineering
EFFECTS OF STRAIN AMPLITUDE ON THE SHEAR MODULUS OF SOILS.
Technical rept. 1 Oct 71-1 Nov 72,
Bobby O. Hardin. Mar 73, 74p Rept no. UKY-TR63-72-CE23 AFWL-TR-72-201
Contract F29601-72-C-0027

Descriptors: (*Soil mechanics, Test methods), (*Pavements, Structural properties), Runways, Strain (Mechanics), Compressive properties, Shear stresses, Loading (Mechanics), Trafficability, Plasticity, Experimental data, Permeability, Silt, Clay, Sand, Landing fields.
Identifiers: Shear tests.

One hundred twenty-three simple shear tests of 24 different soils were conducted. Most were constant-amplitude repeated load tests. A few of the tests involved mixed amplitudes of loading with rest periods between loads. Based on the results, a practical procedure for reducing the shear modulus of soils with increasing strain amplitude was developed. It was shown that for a wide variety of soil types and conditions the procedure gives reasonably accurate results compared to values measured in the laboratory. The study of mixed amplitudes and rest periods indicated that the procedure can be applied to mixed traffic conditions. (Author)

AD-757 583 Not available NTIS
Queen'S Univ Kingston (Ontario) Dept of Civil Engineering
FIELD LOADING TESTS ON MUSKEG,
Garry W. Hollingshead, and Gerald P. Raymond. 10 Mar 72, 13p
Prepared in cooperation with Royal Military Coll., Kingston, Ontario. Presented at the Muskeg Research Conference (14th), Queen's University, Kingston, Ontario, May 10-11, 1971. Revision of report dated 19 May 71.
Availability: Pub. in Canadian Geotechnical Jnl., v9 n3 p278-289 1972.

Descriptors: (*Soil mechanics, *Ontario), (*Foundations (Structures), Stabilization), Soils, Organic materials, Test methods, Test equipment, Deformation, Loading (Mechanics), Pressure, Canada.
Identifiers: *Muskeg, Subgrades, Berms, Embankments.

Results of tests performed using a 6-ft diameter flexible based tank capable of being filled with water are presented. Two series of tests were performed on a muskeg. The first consisted of filling the tank alone and the second with the tank positioned at the center of a 15-ft diameter 2 ft high flexible based reservoir. The results thus simulate the comparison of the effect of berms on the stability of embankments. The resulting vertical movements were measured using a torpedo settlement gauge. The horizontal movements were measured using an inclinometer as well as a horizontal movement device. The pore pressures were measured using fine stoned piezometers. In addition suitable laboratory tests were conducted to compare predicted and measured results. (Author Modified Abstract)

E73-10354 PC$4.50/MF$0.95
Long Island Univ., Greenvale, N.Y. Science Engineering Research Group.
IN SITU SPECTRORADIOMETRIC QUANTIFICATION OF ERTS DATA.
Progress rept. Jul-Dec 72,
Edward F. Yost. Dec 72, 49p TR-21-1 NASA-CR-130864
Contract NAS5-21793
Original contains color imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S.D. 57198.

Descriptors: Arizona, Playas, Soil moisture, Spectroradiometers, Earth resources program, Spectral signatures, Multispectral photography, Quantitative analysis, Spectral reflectance.

The author has identified the following significant results. Additive color photographic analysis of ERTS-1 multispectral imagery indicates that the presence of soil moisture in playas (desert dry lakes) can be readily detected from space. Time sequence additive color presentations in which 600-700 nm bands taken at three successive 18-day cycles show that changes in soil moisture of playas with time can be detected as unique color signatures and can probably be quantitatively measured using photographic images of multispectral scanner data.

N73-16420 PC$3.75/MF$0.95
Purdue Univ., Lafayette, Ind. Lab. for Applications of Remote Sensing.
CHANGES OF MULTISPECTRAL SOIL PATTERNS WITH INCREASING CROP CANOPY.
S. J. Kristof, and M. F. Baumgardner. 1972, 31p
NASA-CR-130035, LARS-PRINT-102372
Contract NGL-15-005-112

Descriptors: *Computer graphics, *Corn, *Multispectral photography, *Soil mapping, Aerial photography, Imaging techniques.

For abstract, see STAR 11 07.

N73-16424 PC$3.00/MF$0.95
Purdue Univ., Lafayette, Ind. Lab. for Applications of Remote Sensing.
APPLICATION OF MULTISPECTRAL REMOTE SENSING TO SOIL SURVEY RESEARCH IN INDIANA.
A. L. Zachary, J. E. Cipra, R. I. Diderickson, S. J. Kristof, and M. F. Baumgardner. 1972, 13p
NASA-CR-130033, LARS-PRINT-110972
Contract NGL-15-002-112

Descriptors: *Indiana, *Multispectral band scanners, *Remote sensors, *Soil mapping, Aerial photography, Computer graphics, Earth resources, Spectral reconnaissance, Spectral signatures.

For abstract, see STAR 11 07.

N73-16434 PC$3.00/MF$0.95
Purdue Univ., Lafayette, Ind. Lab. for Applications of Remote Sensing.
DEFINITION OF SPECTRALLY SEPARABLE CLASSES FOR SOIL SURVEY RESEARCH.
J. E. Cipra, P. H. Swain, J. H. Gill, M. F. Baumgardner, and S. J. Kristof. 1972, 7p
NASA-CR-130031, LARS-PRINT-100372
Contract NGL-15-005-112
Conf- Presented At 8th Intern. Symp. on Remote Sensing of Environment, Ann Arbor, Mich., 2-6 Oct. 1972

Descriptors: *Classifications, *Multispectral photography, *Soil mapping, *Spectral reconnaissance, Aerial photography, Earth resources, Remote sensors, Topography.

For abstract, see STAR 11 07.

N73-16446 PC$3.00/MF$0.95
Kanner (Leo)Associates, Redwood City, Calif.
MEASUREMENTS OF THERMAL CONDUCTIVITY IN THE SUBSOIL.
R. Koitzsch. Feb 73, 14p NASA-TT-F-14664
Contract NASW-2481
Tran- Transl. Into English From Z. Meteorol. (Berlin), V. 19, No. 11/12, 1967 P 375-380

Descriptors: *Clays, *Moisture content, *Thermal conductivity, Measuring instruments, Thermodynamic properties.

For abstract, see STAR 11 07.

8N. Terrestrial Magnetism

N73-16343 PC$4.50/MF$0.95
Stanford Univ., Calif. Inst. for Plasma Research.
POLAR CAP MAGNETIC VARIATIONS AND THEIR RELATIONSHIP WITH THE INTERPLANETARY MAGNETIC SECTOR STRUCTURE.
L. Savlgaard. Sep 72, 46p NASA-CR-130270, SU-IPR-486
Contracts NGR-05-020-559, NSF GA-31138

Descriptors: *Geomagnetism, *Magnetic variations, *Polar regions, *Polarity, Annual variations, Diurnal variations, Magnetic poles.

For abstract, see STAR 11 07.

N73-16411 PC$6.75/MF$0.95
Kakioka Magnetic Observatory (Japan).
GEOMAGNETIC AND GEOELECTRIC OBSERVATIONS, 1971 (RAPID VARIATIONS).
1972, 91p REPT-12

Descriptors: *Geoelectricity, *Geomagnetism, *Magnetic signatures, *Tables (data), Geomagnetic pulsations, Magnetic storms, Magnetometers, Solar flares.

For abstract, see STAR 11 07.

9. ELECTRONICS AND ELECTRICAL ENGINEERING

9A. Components

AD-757 205 PC$3.00/MF$0.95
Royal Aircraft Establishment Farnborough (England)
A THEORY OF ELECTRICAL CONDUCTION IN WIRE BRAIDS.
Technical rept.,
W. T. Blackband. Oct 62, 21p Rept no. RAE-TR-72153 DRIC-BR-32111

Descriptors: (*Coaxial cables, Metallic textiles), (*Radiofrequency cables, Metallic textiles), Electrical conductance, Mathematical analysis, Great Britain.
Identifiers: Braids.

A theory is derived in order to account for the losses in wire braid coaxial conductors in the frequency band where skin effect is not important and in the band where it is well developed. As the theory assumes that there is no current transfer across the wire contacts it would not be applicable in the microwave band without some modification. (Author)

AD-757 219 PC$3.00/MF$0.95
Stanford Univ Calif Microwave Lab
THE TRAVELING SPACE CHARGE WAVE GAAS AMPLIFIER.
Technical rept. no. 1, 6 Apr-5 Oct 72,
G. S. Kino, P. Antognetti, G. R. Bisio, and S. Kofol. Jan 73, 35p Rept no. ML-2117 RADC-TR-72-352
Contract F30602-72-C-0269

Descriptors: (*Microwave amplifiers, *Gallium arsenides), Design, Space charges, X band, Semiconducting films, Manufacturing methods, Gates (Circuits).
Identifiers: Traveling waves, Schottky barriers.

One batch of amplifiers with Schottky-barrier input gates was made. All the devices tended to oscillate, although the available theory predicted a stable behavior. An investigation was started to determine whether higher order modes were responsible for the unstable behavior. In the meantime, a new design was carried out with Schottky-barrier input and output gates, and a new rf test fixture was fabricated and tested. Theoretical investigations of the dc field distribution along the device and the input-output impedance along the device was carried out. (Author)

AD-757 244 PC-GPO/MF$0.95-NTIS
National Bureau of Standards Washington D C
METHODS OF MEASUREMENT FOR SEMICONDUCTOR MATERIALS, PROCESS CONTROL, AND DEVICES.
Quarterly rept. 1 Jul-Sep 72,
W. Murray Bullis. Mar 73, 57p Rept no. NBS-TN-754
Availability: Paper copy available from GPO $0.80 as stock no. C13.46:754.

Descriptors: (*Semiconductors, Electrical properties), (*Semiconductor devices, Test methods), (*Quality control, Semiconductor devices), Silicon, Germanium, Thermal properties, Carriers (Semiconductors), Resistance (Electrical), Microwave equipment, Gamma counters, Bonded joints, Reliability (Electronics).
Identifiers: Process control, Carrier lifetime, Carrier mobility.

Significant accomplishments during this reporting period include design of a plan to provide standard silicon wafers for four-probe resistivity measurements for the industry, publication of a summary report on the photoconductive decay method for measuring carrier lifetime, publication of a comprehensive review of the field of wire bond fabrication and testing, and successful completion of organizational activity leading to the establishment of a new group on quality and hardness assurance in ASTM Committee F-1 on Electronics. Work is continuing on measurement of resistivity of semiconductor crystals; characterization of generation-recombination-trapping centers in silicon; study of gold-doped silicon; development of the infrared response technique; evaluation of wire bonds and die attachment; and measurement of thermal properties of semiconductor devices, delay time and related carrier transport properties in junction devices, and noise properties of microwave diodes. New efforts were initiated in both the die attachment and wire bond evaluation tasks. A description of breakdown tracks, a primary failure mode of monolithic integrated circuits stressed with voltage pulses, is given in a separate appendix. (Author Modfied Abstract)

AD-757 308 Not available NTIS
Army Electronics Technology and Devices Lab Fort Monmouth N J
GENERATION AND SUPPRESSION OF VOLTAGE TRANSIENTS IN MILITARY VEHICULAR ELECTRICAL SYSTEMS,
Bernard Reich, and John Erickson. 1973, 6p
Availability: Pub. in International Automotive Engineering Congress, 5p 8-12 Jan 73. Rept. no. 730044.

Descriptors: (*Suppressors, Transients), Vehicles, Voltage, Electrical equipment, Military requirements, Communication equipment, Semiconductor devices.

Voltage transients generated in military vehicular electrical systems are being suppressed using a transient suppressor of considerable surge capability. This suppressor, a shunt type, is capable of absorbing 250 J in a 50 ms surge. The current and

future increasing reliance on voltage-sensitive semi-conductorized equipment makes it mandatory that transient protection be incorporated into nonmilitary automative systems. Consideration is being given to equipping these non-military automotive systems with high-energy surge suppressors. The paper describes transient suppressor developments at the U.S. Army Electronics Command; that is, suppressors used to protect tactical communications equipment. Emphasis is given to space, weight, and cost in the suppressor design. Examples of voltage transients generated by military vehicular electrical systems are also presented. (Author Modified Abstract)

AD-757 316 Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
CRYSTAL-CONTROLLED OSCILLATORS,
O. P. Layden, W. L. Smith, A. E. Anderson, M. B. Bloch, and D. E. Newell. 16 Feb 72, 10p
Availability: Pub. in Institute of Electrical and Electronics Engineers Transactions on Instrumentation and Measurement, vIM-21 n3 p277-286 Aug 72.

Descriptors: (*Crystal oscillators, Reviews), Quartz, Stability, Temperature, Specifications.
Identifiers: Frequency stability.

Crystal-controlled oscillators are commonly used to provide the stable frequencies required for electronic communications, navigation, and data processing systems. The objectives of the report are to summarize some of the performance characteristics of crystal-controlled oscillators, to propose a suitable terminology for their description, and to suggest the important parameters that should be included in any crystal-oscillator specification.

AD-757 436 Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
RELIABLE INTERCONNECTIONS FOR ARMY AVIONICS,
Jack Spergel, and Elmer F. Godwin. 1970, 11p
Availability: Pub. in Unidentified Jnl.

Descriptors: (*Circuit interconnections, Reliability (Electronics)), (*Helicopters, *Electronic equipment), Electric connectors, Maintainability, Electric terminals, Electric wire, Standardization, Electric cables, Environmental tests.
Identifiers: Avionics.

The increased use of Army avionics requires complex wire interconnections which pose some serious problems in reliability, maintainability, cost and bulk. To alleviate these problems, the Army initiated concurrent programs to improve specific cable and connector components, develop a universal connector termination system and develop an equipment matrix interconnection system. The report discusses the following items: wire-post terminations, flat conductor cables and connectors, connectors with universal terminations and a new matrix interconnection system concept for Army avionics. Development data and current efforts are described. (Author Modified Abstract)

AD-757 441 PC$3.00/MF$0.95
Rockwell International Corp Thousand Oaks Calif Science Center
NONLINEAR MATERIALS FOR ACOUSTIC SURFACE WAVE CONVOLVER,
T. C. Lim, E. A. Kraut, and R. B. Thompson. 1972, 7p
Contract N00014-70-C-0406

Descriptors: (*Piezoelectric crystals, Acoustic properties), Lithium compounds, Niobates, Impedance matching, Acoustic impedance, Nonlinear systems.
Identifiers: *Acoustic surface waves, Surface waves, Lithium niobates.

Acoustic surface wave convolution by nonlinear mixing has been observed in cubic, hexagonal and trigonal crystals. The magnitudes of the phenomenological nonlinear surface wave coupling constants are tabulated and compared with the linear electro-mechanical coupling factor 2 (delta V/V). It has been found that the basal plane of PZT-8 has a larger nonlinear coupling constant than that of the commonly used Y-cut Z propagating LiNbO3. (Author)

AD-757 485 PC$3.00/MF$0.95
Raytheon Co Waltham Mass Research Div
ANALYSIS OF INTERDIGITAL TRANSDUCERS FOR ACOUSTIC SURFACE WAVE DEVICES.
Final rept. 15 Dec 71-14 Dec 72,
Roger H. Tancrell, and Frank Sandy. 14 Mar 73, 30p Rept no. S-1524 AFCRL-TR-73-0030
Contract F19628-72-C-0137

Descriptors: (*Piezoelectric transducers, Acoustic properties), Programming (Computers), Impedance matching, Curve fitting, Time-lag theory, Fourier analysis, Integral transforms, Electrical properties, Performance (Engineering), Least squares method.
Identifiers: Surface waves, *Acoustic surface waves, Interdigital transducers, FORTRAN 4 programming language, FORTRAN, CDC 6600 computers, COMBS computer program, MATCH computer program, TRANS computer program, LMSFT computer program, ACOUST computer program, Fast Fourier transform, Equivalent circuits.

A computer program has been written for the theoretical analysis of interdigital transducers for acoustic surface wave devices. The theory is based on an equivalent circuit model for the acousto-electric interactions. Results are presented in both the frequency and time domains. The program can analyze any general transducer geometry. The program is written in Fortran IV for the CDC 6600 computer. (Author)

AD-757 572 PC$3.00/MF$0.95
Michigan Univ Ann Arbor Electron Physics Lab
THEORETICAL AND EXPERIMENTAL INVESTIGATION OF TRANSFERRED-ELECTRON AMPLIFIERS.
Technical rept.,
A. K. Talwar. Dec 72, 256p Rept no. TR-127
RADC-TR-72-315
Contract F30602-71-C-0099

Descriptors: (*Semiconductor devices, *Microwave amplifiers), Gallium arsenides, Doping, Avalanche diodes, X band, Electrical properties.
Identifiers: Gunn diodes, Computer aided analysis, Negative differential conductivity.

The study is an attempt to understand the behavior and potential of transferred-electron amplifiers. Both subcritically doped as well as supercritically doped devices are considered. A large-signal analysis of subcritically doped, negative conductance-type devices is developed. The analysis is one-dimensional and includes the effects of diffusion, where the diffusion coefficient is dependent upon the electric field. First-order nonlinear equations involving the dc and RF electric fields in the material are obtained for given dc and RF currents driven through the diode. The equations are solved on a digital computer and the results are presented. Various dc and RF characteristics of the diodes are examined. The effects of diffusion, bandwidth considerations, the effects of bias, temperature effects and the effects of doping density are discussed. The experimental study of stable negative conductance amplifiers is presented.

AD-757 718 PC$4.85/MF$0.95
Oak Ridge National Lab Tenn
EFFECTS OF ELECTROMAGNETIC PULSE (EMP) ON A POWER SYSTEM.
Final rept.,
James H. Marable, James K. Baird, and David B. Nelson. Dec 72, 92p* Rept no. ORNL-4836

Descriptors: (*Transmission lines, *Radiation damage), (*Electromagnetic pulses, Transmission lines), (*Explosions, Electromagnetic pulses), Nuclear explosion damage, Lightning arresters, Transformers, Vulnerability, Protection.
Identifiers: *Power transmission lines.

The electromagnetic pulse (EMP), one of the effects of the detonation of a nuclear weapon, consists of a transient wave of intense electric and magnetic fields. These intense fields can cause malfunction or damage to electrical and electronic equipment exposed to EMP. Such malfunction and damage may be widespread if the detonation is at high altitude. In the report are given the results of an investigation of EMP on an electric power distribution system. Only the power circuitry and power components have been considered in this study. The study is based on numerical and analytical calculations, on discussions with distribution company engineers and power-equipment manufacturer engineers, and on experimental work and field trips. Currents and voltages induced by EMP on distribution circuits as well as those reaching the consumer have been calculated. A comparison with lightning pulses has been made, and the protection presently used against lightning has been explored. (Author Modified Abstract)

COM-73-50218 Not available NTIS
National Bureau of Standards, Washington, D.C.
THE USE OF CURRENT GAIN AS AN INDICATOR FOR THE FORMATION OF HOT SPOTS DUE TO CURRENT CROWDING IN POWER TRANSISTORS.
Final rept.,
Frank F. Oettinger, and Sherwin Rubin. 1972, 7p
Sponsored in part by Defense Nuclear Agency, Washington, D.C., and Navy Electronic Systems Command, Washington, D.C.
Pub. in Proceedings of Annual IEEE Reliability Physics Symposium (10th), Las Vegas, Nevada, 5-7 Apr 72, p12-18.

Descriptors: (*Transistors, Nondestructive tests), Electric current, Amplification.

D-C current gain, h (FE), measured as a function of collector voltage, with the collector current held constant, is used as a non-destructive screening technique to indicate the formation of hot spots due to current crowding. Its correlation with and advantages over previously used techniques are described. Examples of the use of this technique are presented for a variety of transistor operating conditions. (Author)

COM-73-50235 Not available NTIS
National Bureau of Standards, Washington, D. C.
WIDE-BAND TWO-STAGE CURRENT TRANSFORMERS OF HIGH ACCURACY.
Final rept.,
T. Michael Souders. 1972, 6p
Pub. in IEEE Transactions on Instrumentation and Measurement, vIM-21 n4 p340-345 Nov 72.

Descriptors: (*Current transformers, Audio frequencies), Broadband, Accuracy, Calibrating.

The design and performance of two high-accuracy transformers, indentified as amplifier-aided two-stage transformers, are described. Each operates from 50 Hz to 10 kHz, supporting burdens up to 1 ohm. Self-contained ratios span from 5/5 to 100/5, with a rated secondary current of 5 A. Results indicate the errors at 10 kHz are within 30 and 15 ppm for the respective transformers, decreasing to less than 1 ppm at 1 kHz. Analysis of high and low-frequency errors is presented, as well as a detailed description of a capacitance trimming technique effecting a factor-of-ten reduction of capacitive errors. Also described is a relatively simple step-up calibration system for determining the trans-

former errors. Calibration results are included. (Author)

JPRS-58321 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
STUDY OF VOLT-AMPERE CHARACTERISTICS OF AN OPTICALLY CONTROLLED AVALANCHE TRANSISTOR,
V. P. Dyakonov, and V. A. Tsigankov. 26 Feb 73, 10p
Trans. of Izvestiya Vysshikh Uchebnykh Zavendenii. Radiofizika (USSR) v14 n9 p1367-1372 1971.

Descriptors: (*Phototransistors, Avalanche breakdown), Electric properties, USSR, Translations.

The report contains a demonstration of the possibility of effective optical control of the shape of S-type volt-ampere characteristics of an avalanche transistor. (Author)

NP-19619 PC$3.00/MF$0.95
Scientific Research Inst. Of Electro-Physical Apparatus, Leningrad (Ussr).
DEFINITION OF ADDITIONAL LOSSES AND STORAGE ENERGY IN SOLENOIDS DURING TRANSIENT PROCESSES.
N. I. Doynikov, N. A. Monoseon, and G. V. Trokhachev. 1971, 16p
Lang- In Russian. U. S. Sales only

Descriptors: *Magnet coils.

For abstract, see NSA 27 06, number 14411.

N73-16186 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
HYPERVELOCITY IMPACT TESTING OF CABLES.
D. W. Jex, A. B. Adkinson, J. E. English, and C. E. Linebaugh. Feb 73, 58p NASA-TN-D-7178, M-450

Descriptors: *Electric wire, *Hypervelocity impact, *Skylab program, *Space environment simulation, Circuits, Impact tests, Micrometeoroids, System failures, Target thickness.

For abstract, see STAR 11 07.

N73-16192 PC$5.50/MF$0.95
Laboratoire Central de Recherches Thomson-csf, Orsay (France). Dept. Microelectronique Hyperfrequence.
STUDY OF GALLIUM ARSENIDE VARACTOR DIODES AND SCHOTTKY DIODES FOR USE AT 20 AND 30 GHZ . ETUDE DE DIODES VARACTORS ET DE DIODES SCHOTTKY A LARSENIURE DE GALLIUM POUR UTILISATION A 20 ET 30 GHZ.
P. Gibeau. 7 Apr 71, 66p
Contract CNES-69.267
Language French

Descriptors: *Frequency multipliers, *Gallium arsenides, *Varactor diodes, *Work functions, Epitaxy, Performance tests, Power gain, Superhigh frequencies, Technology assessment.

For abstract, see STAR 11 07.

N73-16516 PC$12.50/MF$0.95
Philco-ford Corp., Palo Alto, Calif. Western Development Lab. Div.
IMPROVEMENT OF SCREENING METHODS FOR SILICON PLANAR SEMICONDUCTOR DEVICES.
Final Technical Report
W. M. Berger. Sep 72, 209p NASA-CR-124036
Contract NAS12-2197

Descriptors: *Semiconductor devices, *Service life, *Silicon, Dielectric properties, Metal oxide semiconductors, Reliability engineering, Transistors.

For abstract, see STAR 11 07.

PATENT-3711728
Not Available - NTIS
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SOLID STATE DOUBLE-POLE DOUBLE-THROW RELAY.
Patent
F. Villella, and L. C. Hamiter. Patented 16 Jan 73, 6p NASA-CASE-MFS-21270
Filed 19 Aug. 1971
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Electric relays, Transistors, Patents.
Identifiers: PAT.CL. 307-254.

A solid state DPDT relay circuit is reported that has two pairs of p-n-p transistors. One pair normally is conductive so as to provide a closed current path to terminals connected to the collectors of its transistors, the other pair is normally non-conductive so as to provide openings in current paths to terminals connected to the collectors of its transistors. The bases in each pair of PNP transistors are connected to one another, and the emitters of both pairs are connected to two interconnected terminals. The base pairs are connected to an NPN phototransistor of a photon-coupling pair. Switching action is realized by actuation of a light-emitting diode coupled with the phototransistor to change the conductive state of the latter, which in turn changes the conductive states of both pairs of transistors.

PAT-APPL-241 840 PC$3.00/MF$0.95
Department of Transportation, Washington, D.C.
ANTI-REFLECTIVE GLASS.
Patent Application,
Gerard Spanier, William J. Dunn, Philip C. Gustafson, and Edward M. Sawtelle. Filed 6 Apr 72, 9p DOT/Case-A-00177
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: (*Antireflection coatings, *Coating processes), (*Patent applications, Antireflective coatings), (*Cathode ray tubes, Antireflection coatings), Etching, Hydrofluoric acid.

The patent concerns an anti-reflective glass which can be prepared by etching a glass surface until a predetermined degradation of resolution is obtained and then applying an optical anti-reflective coating. The technique produces a cathode ray tube face plate which has higher combined resolution and glare reduction than was previously obtainable. (Author modified abstract)

PAT-APPL-229 084 PC$3.00/MF$0.95
Department of Transportation, Washington, D.C.
FOCUSING PROTECTIVE ENCLOSURE FOR ULTRASONIC TRANSDUCER.
Patent Application,
Edward G. Apgar. Filed 24 Feb 72, 13p DOT/Case-TSC-10025
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: (*Transducers, *Patents), (*Motor vehicle accidents, Collision research), Ultrasonic radiation, Sensors, Safety engineering.

Disclosed is an enclosure for ultrasonic transducers that can either project a narrow beam of energy or receive energy within a narrow cone of angles and also protect the transducer from damage. The enclosure defines an opening that is covered with a screen mesh that permits ingress and egress of wave energy. Within the enclosure the wave energy is subjected to a plurality of reflections from conically shaped reflective surfaces that provide optical shielding for the transducer, yet maintain the planar wave characteristics. An embodiment is disclosed that passes the wave energy through a honeycomb structure to further enhance directional properties. (Author)

RPP/A-92 PC$3.00/MF$0.95
Rutherford High Energy Lab., Chilton (England).
PROGRESS IN MAGNET DESIGN BY COMPUTER.
C. W. Trowbridge. Sep 72, 13p CONF-720908-32
From 4. International Conference On Magnet Technology- Upton, Ny (19 Sep 1972). U. S. Sales only

Descriptors: *Magnet coils, *Magnets.

For abstract, see NSA 27 06, number 14423.

9B. Computers

AAEC/TM-615 PC$3.00/MF$0.95
Australian Atomic Energy Commission Research Establishment, Lucas Heights.
QNPRINT- AN ALTERNATIVE PRINTER FACILITY FOR THE IBM360 COMPUTER.
R. P. Backstrom. Aug 72, 15p
U. S. Sales only

Descriptors: *Computer programs.

For abstract, see NSA 27 06, number 14330.

AD-757 630 PC$3.00/MF$0.95
Center for Naval Analyses Arlington Va Operations Evaluation Group
GRANTAPE: COMPUTER SUB-ROUTINE 22-68S.
H. E. Dost. 24 Oct 66, 14p Rept no. OEG-Research Contrib-74
Contract Nonr-3732 (00)

Descriptors: (*Computer programs, Instruction manuals), Magnetic tape, Monte Carlo method, Information retrieval, Sequential analysis, Random variables.
Identifiers: GRANTAPE computer program, FORTRAN, *Random numbers, Generating functions, Computation, CDC 3400 computers.

The routine, GRANTAPE, is a simple, but flexible, FORTRAN computer program allowing rapid sequential retrieval of a large quantity of numbers stored on magnetic tape. It has been used to avoid generating new Gaussian-distributed random numbers during computations in which correlations, resulting from the use of the same set of numbers for successive computations, are immaterial. The routine requires 675 words, in a CDC 3400 computer. (Author)

AD-757 044 PC$3.00/MF$0.95
Maryland Univ College Park Computer Science Center
DIGITAL PICTURE PROCESSING: MODELS.
Technical rept.,
Azriel Rosenfeld. Jan 73, 31p
Contract N00014-67-A-0239-0062

Descriptors: (*Data processing systems, Images), (*Pattern recognition, Data processing systems), Pictures, Statistical analysis.
Identifiers: Digital pictures, *Image processing, Image enhancement, Scene analysis.

The report is the near-final version of Chapter 13 of a forthcoming book on digital picture processing. It covers descriptions of, and models for, pictures and scenes in terms of objects or regions; objects in terms of vertices and arcs; arcs in terms of chain codes, and regions in terms of 'pieces'. Limitations of such models are discussed. Formal models (grammars, automata) are not treated. (Author)

AD-757 069 PC$3.00/MF$0.95
New York Univ Bronx Dept of Electrical Engineering and Computer Science
IMPLEMENTATION OF EX.GRAF (THE EXTENSIBLE LANGUAGE INCLUDING GRAPHICAL OPERATIONS).
Technical rept.,
Hamid Rafii. Dec 72, 44p Rept no. TR-403-28
Contract N00014-67-A-0467-0010, Grant NSF-GU-3566

Descriptors: (*Programming languages, Design), Graphics, Computer programs, Control sequences.
Identifiers: *Computer graphics, Adage AGT 30 computers, Data structures, EXGRAF programming language, Input output routines.

The report describes the implementation of a simple version of the EX.GRAF (the Extensible Language Including Graphical Operations) on the Adage AGT 30 computer, and describes the approach as well as the results obtained so far. Much of the report is concerned with the description of the routines, which, as run-time routines, will implement different features of the language. (Author)

AD-757 090 PC$3.00/MF$0.95
Network Analysis Corp Glen Cove N Y
RESEARCH IN STORE AND FORWARD COMPUTER NETWORKS.
Final rept. 13 Oct 69-12 Oct 72,
Howard Frank. Dec 72, 125p
Contract DAHC15-70-C-0120, ARPA Order-1523
See also report dated 15 Jun 72, AD-748 338.

Descriptors: (*Data processing systems, Networks), (*Data transmission systems, Reliability (Electronics)), Costs, Topology, Algorithms, Mathematical models.
Identifiers: *Computer networks, ARPA computer network, Network flows.

The document describes research efforts to determine: (1) the most economical configurations to meet growth requirements in the ARPANET, (2) properties of packet switched computer communication networks, (3) analysis and design techniques for large scale networks, (4) cost/throughput/reliability characteristics of large packet switched networks for potential application to Defense Department computer communication requirements. The heart of the research program has been the dual attack on basic network theoretical problems and the development of computational techniques for handling large network structures. Results on properties of the ARPANET, properties of large networks, and new computational techniques are described for subjects as traffic sensitivity, peak bandwidth, reliability, cost and throughput and routing. (Author)

AD-757 119 PC$4.50/MF$0.95
System Development Corp Santa Monica Calif
AN OVERVIEW OF IMAGE PROCESSING.
Special technical rept.,
Joan E. Bebb, William D. Stromberg, and Robert E. Nimensky. 1 Mar 73, 51p* Rept no. SDC-TM-5068/001/00
Contract DAHC15-73-C-0080

Descriptors: (*Data processing systems, Optical images), Distortion, Degradation, Signal-to-noise ratio, Pattern recognition, Colors, Video signals, Optical scanning, Cameras, Sensors, Programming languages.
Identifiers: *Image processing, Digital pictures, Feature extraction, IBM system/360 operating system, IBM 360 computers, IBM 370 computers, IBM 360/44 computers, VICAR system, ITEK system, CDC 3300 computers, LIP1 programming language, FORTRAN, VL system, Biomedical interactive system, POP-10 computers, PAX programming language.

Image processing, the enhancement of information within images and the extraction of information from them, is an application area of engineering, mathematics, and computer technology which has found uses throughout the medical, scientific, governmental, agricultural, and industrial communities. The specific tasks of image processing and the computer systems which have been developed to perform them are the subject of this document. The report includes a discussion of hardware and software functions; current image processing systems and programming languages, and suitable applications. (Author)

AD-757 160 PC$26.25/MF$0.95
Foreign Technology Div Wright-Patterson AFB Ohio
INFORMATION PROCESSING MACHINES. VOLUME III.
Oct 59, 482p Rept no. F-TS-10126
Trans. of mono. Stroje Nazpracovani Informaci. Sbornik III, Prague, 1955.

Descriptors: (*Data processing systems, Czechoslovakia), Computers, Logic circuits, Computer storage devices, Coding, Information theory, Control systems, Matrix algebra, Set theory, Functions, Interpolation, Punched cards.
Identifiers: Information processing, Translations, Telecommunication, Control theory, Computation, Theory of equations.

Contents:
- Common problems of communication equipment and mathematical computers;
- Machine for the computation of crystal structures;
- Machine for Fourier's synthesis;
- Use of the Korobov sequence in mathematical machines;
- Machine for testing the central memory of the Czechoslovakian computer SAPO;
- Analog computer for the solution of higher-order algebraic equations by weighing;
- Solution of a determined problem of meteorology by means of punch card processing machines;
- Determination of complex roots of algebraic equations on a punch card computer;
- Solutions of linear algebraic equation systems;
- Interpolation of cot alpha in the neighborhood alpha = 0;
- Origin of the code and of number system of the remainder classes;
- Operational circuits;
- Single-cycle dyadic relay adders;
- Mathematical machines of the laboratory for crystal structures of the institute for technical physics;
- Stabilized-output electronic generator for network analyzers;
- Czechoslovakian network analyzers of electric networks.

AD-757 181 PC$3.00/MF$0.95
Computer Corp of America Cambridge Mass
DATACOMPUTER PROJECT SEMI-ANNUAL TECHNICAL REPORT, FEBRUARY 1, 1972 TO JULY 31, 1972.
1972, 59p
Contract DAHC04-71-C-0011, ARPA Order-1731

Descriptors: (*Data processing systems, Networks), Data transmission systems, Input-output devices, Information retrieval, Programming (Computers).
Identifiers: Datacomputer project, *Computer networks, Computer storage management, ARPA computer network, PDP-10 computers.

The goal of the project is the development of a shared, large-scale data system for the ARPA community. The system may be viewed as a box that performs the functions of data storage and data management on behalf of multiple computers simultaneously connected to the box. The topics discussed in the report include the following: Hardware installation; Software design and implementation; Coordination activities; and Working paper no. 5, 'Datacomputer Software Architecture--Revision 1'.

AD-757 226 PC$3.00/MF$0.95
New York Univ Bronx Dept of Electrical Engineering and Computer Science
CONTOUR DETECTION IN NOISY PICTURES USING HEURISTIC SEARCH METHODS.
Technical rept.,
Alberto Martelli. Sep 72, 41p Rept no. TR-403-27
AFOSR-TR-73-0377
Grant AF-AFOSR-1854-70

Descriptors: (*Programming (Computers), Pattern recognition), (*Pattern recognition, Pictures), Graphics, Search theory, Artificial intelligence, Algorithms.
Identifiers: Edge detection, Contour detection, Image processing, Graph theory, Heuristic methods, Computer graphics, Feature extraction, FORTRAN, UNIVAC 1108 computers.

A method for detecting contours in noisy pictures is presented. The problem of contour detection is reduced to the problem of finding a minimal-cost path in a weighted graph. A figure of merit takes into account the properties of the contour, and graph searching techniques are used to find the contours which minimize the given figure of merit. Because of the global approach, this method has great flexibility. Some experimental results are given, which show how information about the shape of the object to be detected can be incorporated in the figure of merit, thus allowing the extraction of contours from noisy pictures and the separation of touching objects. (Author)

AD-757 260 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
A PL360-BASED COMPILER GENERATING SYSTEM.
Master's thesis,
Robert Allen Woods. Dec 72, 112p

Descriptors: (*Compilers, Design), Algorithms, Computer programs, Syntax, Interfaces, Control sequences, Theses.
Identifiers: IBM 360 computers, PL360 programming language, Translator routines.

A compiler generating system written in the language PL360 to run on IBM System/360 computers is presented. The concepts and principles of the XPL compiler generating system are reviewed. The SLR (k) parsing algorithms is briefly described, and an example of SLR (1) parsing is presented. A description of the compiler generating system is presented along with its limitations, and instructions for its use are given. The required PL360 to System/360 interface is described and a listing is included. Program listings and sample input and output are included in the appendices. (Author)

AD-757 366 PC$3.00/MF$0.95
Stanford Univ Calif Dept of Computer Science
URAND: A UNIVERSAL RANDOM NUMBER GENERATOR,
Michael A. Malcolm, and Cleve B. Moler. Jan 73, 8p Rept no. STAN-CS-73-334
Contract N00014-67-A-0112-0029

Descriptors: (*Programming (Computers), Algorithms), Binary arithmetic, Number theory, Statistical tests.
Identifiers: Random numbers, FORTRAN, ANSI FORTRAN programming language, URAND computer program.

A subroutine for generating uniformly-distributed floating-point numbers in the interval (0,1) is presented in ANSI standard Fortran. The subroutine, URAND, is designed to be relatively machine independent. URAND has undergone minimal testing on various machines and is thought to work properly on any machine having binary integer

number representation, integer multiplication modulo m and integer addition either modulo m or yielding at least log of m to the base 2 significant bits, where m is some integral power of 2. Upon the first call of URAND, the value of m is automatically determined and appropriate constants for a linear congruential generator are computed following the suggestions of D. E. Knuth, Volume 2. URAND is guaranteed to have a full-length cycle. (Author)

AD-757 367 PC$3.00/MF$0.95
Stanford Univ Calif Dept of Computer Science
ON THE POWER OF PROGRAMMING FEATURES.
Ashok K. Chandra, and Zohar Manna. Jan 73, 31p
Rept nos. STAN-CS-73-333, AIM-185
Contract SD-183, ARPA Order-457
Sponsored in part by Contract NSR-05-020-500.
Report on Stanford Artificial Intelligence Project.

Descriptors: (*Programming languages, Mathematical logic), Recursive functions, Queueing theory, Set theory, Graphics, Binary arithmetic.
Identifiers: Schema theory, Computation, Boolean functions, ALGOL, FORTRAN, PL/1 programming language.

The authors consider the power of several programming features such as counters, pushdown stacks, queues, arrays, recursion and equality. In the study program schemas are used as the model for computation. The relations between the powers of these features is completely described by a comparison diagram. (Author)

AD-757 374 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
QUESTION-ANSWER INPUTS TO A SIMULATION PROGRAM GENERATING SYSTEM.
Master's thesis,
Eldon Stover Baker. Jun 71, 98p

Descriptors: (*Programming (Computers), Simulation), Time sharing, Theses, Computer programs.
Identifiers: Data structures, Automatic language processing, Natural language, FORTRAN, Question answering systems, Computerized simulation, IBM 360/67 computers.

One of the objectives of a research effort is the realization of a 'simulation program generating system' to produce executable computer programs from natural language descriptions of simulation problems. The basic part of the system being developed is a FORTRAN program for translating input text into a representative data structure and constructing output text from the data structure. Previous work has resulted in the capability to translate the data structure for a simulation problem into an English text description and a GPSS computer program. The purpose of this thesis was to supplement the above with an interactive question-answer scheme that generates the simulation problem data structure. The resulting GPSS 'simulation program generating system' is capable of handling a variety of simple queuing problems. (Author)

AD-757 375 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
TRANSLATION OF A QUEUING PROBLEM DESCRIPTION INTO GPSS-LIKE TABLES.
Master's thesis,
John Henry Rickelman. Jun 72, 96p

Descriptors: (*Programming (Computers), English language), Queueing theory, Computer programs, Time sharing, Computational linguistics, Digital computers, Data processing systems, Coding, Theses, Simulation.
Identifiers: FORTRAN, IBM 360/67 computers, Data processing terminals, GPSS programming language, Digital simulation.

A system called NLPQ is being developed at the Naval Postgraduate School as part of a research project in natural language man-machine communication. The basic part of the system consists of a rule language and programs to compile and execute rules. NLPQ currently allows a user to enter an English text description of a simple queuing problem at a time sharing terminal, have the computer construct an Internal Problem Description, and then produce an equivalent English text description and a GPSS simulation program to solve the problem. Recently, a FORTRAN routine for performing a GPSS-like simulation was incorporated into the system. The thesis reports on the development of another set of rules for NLPQ to translate an Internal Problem Description into an array of information required by this FORTRAN routine to perform the simulation. (Author)

AD-757 401 PC$3.00/MF$0.95
Royal Aircraft Establishment Farnborough (England)
THE IMPLEMENTATION OF ACCOUNTING FOR PROGRAMS RUN ON THE 1907 COMPUTER AT RAE FARNBOROUGH.
Technical memo.,
Irene M. Cummings. Mar 71, 59p Rept no. RAE-TM-Math-7007 DRIC-BR-25414

Descriptors: (*Computer programs, Classification), Instruction manuals, Operation, Control sequences, Time studies, Management planning, Great Britain.
Identifiers: ICL 1907 computers.

The memorandum describes in general the method of producing accounts for all jobs on the 1907. It also describes in some detail the actual accounting program. (Author)

AD-757 458 PC$3.00/MF$0.95
Saclant ASW Research Centre La Spezia (Italy)
THE SACLANTCEN SHIPBORNE COMPUTER ENVIRONMENTAL-DATA ACQUISITION SYSTEM. VOLUME I. OBJECTIVES, DESIGN CRITERIA AND SYSTEM ORGANIZATION,
Francesco Spina. 1 Mar 73, 18p Rept no. SACLANTCEN-SM-6

Descriptors: (*Data processing systems, Shipborne), Real time, Oceanographic vessels, Oceanographic data, Meteorological parameters, Italy.
Identifiers: Hewlett-Packard 2005B computers, Data acquisition.

An automatic environmental-data logging and computing system installed on board SACLANTCEN's research vessel is described. The initial specifications and the basic problems encountered in changing from a conventional automatic to a computerized system are discussed. The features of the computer at the heart of the whole system are examined. Despite its limitations the system has proved to be an efficient means of real-time environmental-data acquisition. Specific items of the system are described in other memoranda of the series. (Author)

AD-757 477 PC$6.00/MF$0.95
Sperry Rand Corp St Paul Minn UNIVAC Defense Systems Div
KNOXVILLE ASSOCIATIVE PROCESSOR EVALUATION.
Final evaluation rept.,
B. G. Dietzler. Nov 72, 326p Rept no. PX-6406-Rev-A FAA-RD-73-17
Contract DOT-FA70WA-2289

Descriptors: (*Data processing systems, *Air traffic control systems), Programming (Computers), Control sequences, Real time, Radar Tracking, Detection, Algorithms, Tennessee.
Identifiers: UNIVAC 1230 computers, Associative processors, Knoxville (Tennessee), APPLE programming language, Evaluation.

The document contains an evaluation of the Goodyear Aerospace Associative Processor in performance of the tracking and conflict detection functions in a real-time ATC environment. The AP evaluation effort was performed at Knoxville, Tennessee, with Univac as the prime contractor to the FAA and with Goodyear Aerospace and Lambda as sub-contractors to Univac. (Author)

AD-757 493 PC$3.00/MF$0.95
Texas Univ Austin Electronics Research Center
ASPECTS OF A DYNAMICALLY ADAPTIVE OPERATING SYSTEM.
Technical rept.,
Parker Ray Blevins, and C. V. Ramamoorthy. 31 Jul 72, 143p Rept no. TR-132 AFOSR-TR-72-1930
Contract F44620-71-C-0091

Descriptors: (*Data processing systems, Management planning), Input-output devices, Scheduling, Queueing theory, Statistical analysis, Decision theory, Multiple operation, Programming (Computers), Algorithms, Graphics, Real time, Adaptive systems.
Identifiers: Multiprogramming, Central processing units, Information systems, Service time, Resource allocation, Operating systems (Computers).

Real-time optimization of the overall performance of a computer system inherently requires the introduction of adaptive control into selected control functions or sets of control functions. Global management of the resulting multiloop control system becomes the responsibility of the operating system. Investigated aspects of this evolutionary extension of the operating system called the Dynamically Adaptive Operating System include the general methodogy, the real-time modeling and estimation of resource demands, and implementation considerations of an adaptive CPU scheduling function. The proposed methodology consists of three processes, Identification, Decision, and Modification, and a control and information flow hierarchy. System status descriptors are classified and developed. Investigated aspects of the real-time modeling and estimation of resource demand patterns include: a general principle of locality, statistical models providing either one or two degrees of estimator freedom including a Dynamically Partitioned Second Moment Model, and techniques for approximating the remaining time estimators. (Author Modified Abstract)

AD-757 495 PC$3.00/MF$0.95
Texas Univ Austin Electronics Research Center
IMPROVEMENT IN A SYSTEM'S THROUGHPUT--FROM THE STANDPOINT OF FILE ORGANIZATION AND SEARCHING STRATEGIES.
Technical rept.,
Yeh-Hao Chin, and C. V. Ramamoorthy. 5 Sep 72, 162p Rept no. TR-137 AFOSR-TR-72-2014
Contract F44620-71-C-0091, Grant NSF-GJ-28452

Descriptors: (*Data processing systems, *Information retrieval), Search theory, Algorithms, Mathematical logic, Decision theory, Convex sets, Mathematical models, Theorems.
Identifiers: *File structures, *Computer storage management, Resource allocation, Information systems.

Even after two decades of commercial availability of the computer, the 'potentiality' of the digital system has been used merely 65 percent or less. The reasons for inefficient use arise partly from inefficient design of system software rather than limitations due to hardware. File organization and the structure of memory hierarchy are portions of the total memory management system which is the most influential factor of a digital system's throughput. In this report the case of a large file is considered in which the frequency of use of its component subfiles are known. The organization of the file is developed so that the average number of entries to locate k (>1) items at a time in it by means of binary search or sequential search is

minimized. The methods are used to solve the realistic problem of designing an optimal memory hierarchy to hold the file in a computer system. (Author Modified Abstract)

AD-757 500 PC$6.00/MF$0.95
Defense Documentation Center Alexandria Va
COMPUTERS IN INFORMATION SCIENCES: (COMPUTER PROCESSING OF ANALOG DATA).
Report bibliography Jan 68-Apr 72.
Mar 73, 188p* Rept no. DDC-TAS-73-7
See also AD-679 401.

Descriptors: (*Information retrieval, *Bibliographies), (*Analog computers, Information retrieval), Data processing systems, Digital computers, Analog-digital computers, Computer storage devices, Input-output devices, Display systems, Mathematical models, Automata, Time sharing, Real time, Programming (Computers), Computers, Analog-to-digital converters, Analog systems, Data, Abstracts.
Identifiers: *Information sciences, On line systems, Signal processing, Computerized simulation, Information systems.

The bibliography compiles references processed into the Defense Documentation Center's data bank from January 1953 to January 1973 that deal specifically with the role of computer processing of analog data. Corporate Author/Monitoring Agency, Subject, Title, Personal Author, Contract, and Report Number Indexes are provided. (Author)

AD-757 525 PC$3.00/MF$0.95
Maryland Univ College Park Computer Science Center
VISUAL TEXTURE ANALYSIS IV.
Technical rept.,
K. C. Hayes, Jr., A. N. Shah, and Azriel Rosenfeld. Feb 73, 19p Rept no. TR-230 AFOSR-TR-73-0482
Contract F44620-72-C-0062

Descriptors: (*Pattern recognition, Surfaces), Surface roughness, Photographic analysis, Visual inspection.
Identifiers: *Texture, Feature extraction.

Several measures of texture coarseness, based on average 'best' edge size or spot size in one or two dimensions, were computed for texture samples having a known scale ratio. The results were highly consistent, but fell short of yielding the given ratio. (Author)

AD-757 530 PC$3.00/MF$0.95
New York Univ Bronx Dept of Electrical Engineering and Computer Science
AUTOMATIC DATA PROCESSING TECHNIQUES FOR GRAPHIC-DATA DISPLAY, GENERATION AND ANALYSIS.
Interim scientific rept. 1 Sep 71-31 Aug 72,
H. Freeman. 31 Aug 72, 14p AFOSR-TR-73-0480
Grant AF-AFOSR-1854-70

Descriptors: (*Data processing systems, Graphics), Photographic images, Maps, Mechanical drawings, Programming languages.
Identifiers: Computer graphics, Scene analysis, Image processing, Edge detection, Feature extraction.

The report provides a brief summary of research progress during the period 1 September 1971 - 31 Aug 1972. Research under this grant is concerned with computer graphics and image processing, especially scene analysis, and to a large extent represents a continuation of work started during the previous year. A list of publications resulting from the research to date is included. (Author Modified Abstract)

AD-757 548 PC$6.75/MF$0.95
Texas Univ Austin Electronics Research Center
DESIGN OF A MULTILEVEL MICROPROGRAMMABLE COMPUTER AND A HIGH-LEVEL MICROPROGRAMMING LANGUAGE.
Technical rept.,
Masahiro Tsuchiya, and C. V. Ramamoorthy. 15 Aug 72, 237p* Rept no. TR-135 AFOSR-TR-72-1971
Contract F44620-71-C-0091, Grant NSF-GJ-28452

Descriptors: (*Data processing systems, Multiple operation), (*Programming language, Design), Data storage systems, Optimization, Algorithms, Semantics, Syntax, Context free grammars, Control sequences, Programming (Computers).
Identifiers: *Microprogramming, SIMPL programming language, Backus normal form.

A mulitlevel microprogrammable computer and a high-level parallel microprogramming language as integral parts of a user microprogrammable system has been designed. Their primary design objective is to support the user microprogramming concept and practice. A multilevel microprogrammable computer matches a hierarchy of microprogram to that of microprogram memories. Executing microprograms via a cache memory, it self-optimizes microprogram structures by 'natural selection' to given problem environs to enhance its performance. An algorithm for determining an optimum microprogram memory allocation is derived to realize an optimum cost-performance of the computer. The proposed high-level microprogramming language permits the compiler to detect parallel control streams; it can be compiled into parallel microprograms in a horizontal microinstruction format. The proposed computer and microprogramming language are applied to microprogram significance arithmetic for comparative evaluations. (Author Modified Abstract)

AD-757 566 Not available NTIS
Hawaii Univ Honolulu
PROCEEDINGS OF THE HAWAII INTERNATIONAL CONFERENCE ON SYSTEM SCIENCES (6TH) HELD IN HONOLULU, HAWAII, 9-11 JAN 73.
Art Lew. 1973, 555p AROD-11350:1-RT
Grant DA-ARO-D-31-124-73-G78
See also AD-757 590.
Availability: Paper copy available from Western Periodicals Co., 13,000 Raymer St., N. Hollywood, Calif. 91605. Price not available.

Descriptors: (*Programming (Computers), Symposia), (*Ecology, Mathematical models), (*Pattern recognition, Symposia), (*Computers, Symposia), (*Game theory, Algorithms), (*Information theory, Symposia), (*Cybernetics, Symposia), Programming languages, Mathematical programming, Systems engineering, Stability, Statistical analysis, Data processing systems, Tracking, Control systems.
Identifiers: Computer aided analysis, Automata theory, *Control theory, Biocybernetics, Switching theory.

Contents:
- Computer aids to program verification;
- Mathematical ecology;
- Time-varying and distributed parameter systems;
- Pattern recognition - Methods;
- Computer science - software;
- Optimal control and games;
- Pattern recognition: Speech and image processing;
- Theoretical and practical approaches to constructing ultra-reliable computer systems;
- Perspectives in optimization;
- Communication theory;
- Computer systems and security;
- Optimization techniques for functions of n variables;
- Switching and automata - I;
- Identification;
- Switching and automata - II;
- Optimization applications;
- Estimation and filtering;
- Biocybernetics;
- Multi-user channels - theory;
- Computer architecture;
- Large-scale systems;
- Multi-user channels (ALOHA);
- Graphs and networks;
- Stability and adaptive control;
- Tracking;
- Methods for large systems: sparse matrices and graph theory;
- Computer science - Applications;
- Aerospace systems technology;
- Communications;
- Circuits and systems.

AD-757 589 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
IMPROVING THE EFFICIENCY OF A NATURAL LANGUAGE PROCESSOR.
Master's thesis,
Alfred H. Mossler. Jun 72, 64p

Descriptors: (*Programming (Computers), English language), Syntax, Semantics, Man-machine systems, Coding, Decoding, Compilers, Theses.
Identifiers: FORTRAN, FORTRAN 4 programming language, IBM 360/67 computers, Natural language.

NLP is a processor being developed at the Naval Postgraduate School for research in natural language man-machine communication. With this system text can be translated into an entity-attribute-value information structure, and such a structure can be translated into text. These two processes, called decoding and encoding, respectively, are specified by writing 'rules' in a language designed for this system. The thesis reports on a scheme for storing these rules in the computer in a compact fashion, and describes the related routines. The savings in core storage and CPU time achieved by using this scheme are given for a particular application of NLP. (Author)

AD-757 614 PC$3.00/MF$0.95
Singer Co Glendale Calif Librascope Div
DATA ENTRY AND EDIT MONITOR.
Quarterly progress rept. no. 2, 1 Oct-31 Dec 72,
T. Shelton. Mar 73, 24p ECOM-0277-2
Contract DAAB07-72-C-0277
See also AD-756 934.

Descriptors: (*Input-output devices, Cathode ray tube screens), Control panels, Cathode ray tubes, Electron optics, Data storage systems, Design.
Identifiers: *Data displays.

The Data Entry and Edit Monitor is a rear ported CRT display including a projector, for overlay projection onto the cRT screen, and associated electronics to interface with an external data source. The device is packaged as a display unit, a power supply unit, and associated cables. The report covers the system design.

AD-757 643 PC$3.00/MF$0.95
Naval Ship Research and Development Center Bethesda Md
FORTRAN SUBROUTINES FOR THE EXPANSION OF A PROBABILITY DENSITY IN A GRAM-CHARLIER SERIES.
Research and development rept.,
F. J. Garner, and S. Berkowitz. Aug 72, 41p Rept no. NSRDC-3848

Descriptors: (*Programming (Computers), Probability density functions), Polynomials, Series, Time series analysis, Computer programs.
Identifiers: Gram-Charlier series, FORTRAN, IBM 7090 computers, CDC 6700 computers, Hermite functions.

The report documents two FORTRAN subroutine packages (implemented on the IBM 7090 and CDC 6700), GRAMCO and HERPO, that generate

values for Gram-Charlier series coefficients and Hermite polynomials, respectively, where the coefficient and polynomial may have arbitrary order and as many as seven dimensions. The subroutines implement recurrence relations developed at the Naval Ship Research and Development Center by Dr. S. Berkowitz which generate the polynomials and coefficients without using partial differentiation. The routines employ an efficient algorithm which specifies the minimal set of lower-ordered coefficients of polynomials needed to compute a requested coefficient or polynomial value. (Author)

AD-757 644 PC$3.00/MF$0.95
Naval Ship Research and Development Center Bethesda Md
THE NASTRAN CONTOUR PLOTTER.
Research and development rept.,
Barbara M. Kelly. Jun 72, 24p Rept no. NSRDC-3887

Descriptors: (*Programming (Computers), Structural properties), Graphics, Mechanical properties, Plotters.
Identifiers: IBM 360 computers, CDC 6000 computers, UNIVAC 1108 computers, NASTRAN computer program, Computer graphics, Structural analysis, Finite element analysis.

The NASTRAN Contour Plotter, a group of subroutines and modifications to the NASTRAN Plot Module, enable contour lines to be superimposed on the plot of the structural model or on an outline of the structural model. The NASTRAN Contour Plotter can be incorporated into NASTRAN Version 12. Consistent with the NASTRAN computer program, it is operational on the IBM 360, the CDC 6000, and the UNIVAC 1108 computers on a variety of plotter hardware. (Author)

AD-757 680 PC$3.00/MF$0.95
Stanford Research Inst Menlo Park Calif Network Information Center
HOST/HOST PROTOCOL FOR THE ARPA NETWORK,
Alex McKenzie. Jan 72, 37p Rept no. NIC-8246
Prepared in cooperation with Bolt Beranek and Newman, Inc., Cambridge, Mass.

Descriptors: (*Data processing systems, Networks), Data transmission systems, Information theory, Control sequences.
Identifiers: ARPA computer network, *Computer networks, Telecommunication.

The document specifies a protocol for use in communication between Host computers on the ARPA Network. In particular, it provides for connection of independent processes in different Hosts, control of the flow of data over established connections, and several ancillary functions.

AD-757 681 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
G E S: A DATA-STRUCTURE-TO-GPSS ENCODING SYSTEM.
Master's thesis,
Richard Carl Hansen. Dec 70, 75p

Descriptors: (*Programming (Computers), English language), (*Programming languages, Transformations), Syntax, Semantics, Mathematical logic, Artificial intelligence, Coding, Theses.
Identifiers: *Natural language processors, GPSS programming language, IBM 360/67 computers, Data structures.

A research effort currently underway at the Naval Postgraduate School deals with the design and implementation of a computer system for translating natural language descriptions of simulation problems into executable computer programs. In the system, English text is translated into an internal data structure, which can be considered to be the computer's mental image of a simulation problem. This internal data structure is then translated into a computer program which will perform the simulation. The thesis reports on the design of an appropriate internal data structure for conveniently representing simple queueing problems and on the development of a procedure for translating such a data structure into a GPSS program. Also, pertinent aspects of the overall system are briefly described, and an example application to a specific problem is included. (Author)

AD-757 683 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
AN AN-UYK/7 INTERPRETER IMPLEMENTED ON THE IBM SYSTEM/360.
Master's thesis,
Frederick Clair Powell, Allen Borden Webb, and James Richardson King. Dec 72, 136p

Descriptors: (*Programming (Computers), Instruction manuals), Computer programs, Input-output devices, Interfaces, Syntax, Theses, Multiple operation, Digital computers, Shipborne.
Identifiers: AN/UYK-7, Multiprocessing, Interpreter routines, IBM 360 computers, Central processing units, PL360 programming language.

An IBM System/360 based interpreter program for the AN/UYK-7 multiprocessing computer system is presented. The program provides interpretive execution of the AN/UYK-7 instruction set, an interrupt-handling capability, a variable-sized simulated memory and a multiprocessing capability for up to three central processors. Input/output is limited to a card reader and a line printer. Various segments of the program are discussed and a detailed User's Manual is provided. (Author)

AD-757 686 PC$3.00/MF$0.95
Computer Corp of America Cambridge Mass
NETWORK DATA HANDLING SYSTEM.
Semiannual technical rept. 1 Aug 72-31 Jan 73,
Thomas Marill. 31 Jan 73, 37p AROD-9816:2-A
Contract DAHC04-71-C-0011, ARPA Order-1731
Report on Datacomputer Project.

Descriptors: (*Data processing systems, Networks), (*Programming languages, Design), (*Data storage systems, Performance (Engineering)), Data transmission systems, Information retrieval, Weather communications, Programming (Computers).
Identifiers: Datacomputer project, Information systems, *Computer networks, Computer storage management.

The report describes the activities for the period 1 Aug 1972 - 31 Jan 1973. The activity on the project has centered on development of the first software release, initial system demonstration, coordination with potential users, and work on a global weather data base. (Author)

AD-757 701 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
THE TRANSLATION OF DATA STRUCTURE REPRESENTATIONS OF SIMPLE QUEUING PROBLEMS INTO GPSS PROGRAMS AND ENGLISH TEXT.
Master's thesis,
Robert Thomas McGee. Jun 71, 74p

Descriptors: (*Programming (Computers), English language), (*Programming languages, Transformations), Syntax, Semantics, Man-machine systems, Coding, Decoding, Theses.
Identifiers: Natural language processors, Natural language, GPSS programming language, Data structures.

One of the goals of computer technology is to have the ability to communicate with the computer in a natural language such as English. A research effort underway at the Naval Postgraduate School involves the design and implementation of a computer system for translating natural language descriptions of simulation problems into executable computer programs. In this system, English text is translated into an internal data structure which is then translated into a computer program for performing the simulation. This thesis reports on an effort made to aid the user of this system by (1) extending the capabilities of an existing procedure for translating the internal data structure into a GPSS simulation program, and (2) developing a procedure for translating the data structure into English text so the user could see that his input text had been correctly interpreted. The basic operation of the system is described and examples are given to illustrate the system's capabilities. (Author)

AEEW-R-806 PC$3.00/MF$0.95
Atomic Energy Establishment, Winfrith (England).
FADDEEV- A FORTRAN CODE FOR THE CALCULATION OF THE FREQUENCY RESPONSE MATRIX OF MULTIPLE-INPUT, MULTIPLE--OUTPUT DYNAMIC SYSTEMS.
D. H. Owens. Jun 72, 31p
U. S. Sales only

Descriptors: *Computer programs.

For abstract, see NSA 27 06, number 14339.

ANCR-1040 PC$3.00/MF$0.95
Aerojet Nuclear Co., Idaho Falls, Idaho.
FPS- FLOATING POINT ARITHMETIC SOFTWARE FOR DEC PDP-8 SERIES COMPUTERS.
W. R. Myers. Dec 72, 51p
Contract AT (10-1)-1375

Descriptors: *Computer programs, *Computers.

For abstract, see NSA 27 06, number 14344.

CEA-R-4368 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Saclay (France). Centre D'Etudes Nucleaires.
NEW METHODS FOR THE EVALUATION OF RELIABILITY PATTERN RECOGNITION.
B. V. Koen. Oct 72, 112p
Lang- In French. U. S. Sales only

Descriptors: *Reactors.

For abstract, see NSA 27 06, number 14033.

CEA-R-4370 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Saclay (France). Centre D'Etudes Nucleaires.
PROBLEMS RELATED TO THE AUTOMATIC PATCHING OF A HYBRID COMPUTER.
Jean Vergnes. Oct 72, 186p
Lang- In French. Thesis. U. S. Sales only

Descriptors: *Computers.

For abstract, see NSA 27 06, number 14359.

COM-73-10383 PC$3.00/MF$0.95
Utah Univ., Salt Lake City. Bureau of Economic and Business Research.
THE IMPLEMENTATION OF COMPOSITE COMPUTER MAPPING,
Frank C. Hachman, Craig Bigler, and Rodger Weaver. Dec 71, 238p FCRC-TA-611-666-014

Descriptors: (*Computer programming, *Mapping), (*Economic development, Decision making), Economic surveys, Population (Statistics), Transportation, Industries, Pattern recognition, Graphic methods, Land use, Employment, Allocation models.
Identifiers: Computer mapping techniques, Composite computer mapping, UNIVAC 1108 computers, CDC 6400 computers.

Composite computer mapping (CCM) is the name assigned to a recently developed technique to enhance the quality of decision making in the administration of aid to economic development. Chapter 1 serves as an introduction to the project and presents the nature and intent of composite mapping; Chapter 2 organizes the mapped basic factors into four sections by type of factor mapped: transportation, land use and characteristics, population, and work force and employment. Chapter 3 consists of three major sections: application demonstrations of Opportune Location Maps (Oplocs) for manufacturing industries, illustrative applications in tourism and recreation and in mineral extraction project decision-areas; and, Chapter 4 is the most demanding of the chapters. It takes the last five maps for presentation of research and mapping strategies for subsequent applications. The initial map production software used the Utah University UNIVAC 1108 but has been converted to the CDC 6400. (Author Modified Abstract)

CONF-721202-4 PC$3.00/MF$0.95
Oak Ridge National Lab., Tenn.
LIST OR SORT SOME EXPERIENCE WITH THE ORIC MULTIPARAMETER DATA ACQUISITION SYSTEM.
D. C. Hensley. 1971, 13p
Contract W-7405-ENG-26
From Nuclear Science Symposium And Exhibits-

Descriptors: *Data acquisition systems, *Ornl isochronous cyclotron.

For abstract, see NSA 27 06, number 12680.

COO-3288-23 PC$3.00/MF$0.95
Johns Hopkins Univ., Baltimore, Md.
REPRESENTATION OF CONCURRENCY WITH ORDERING MATRICES.
G. S. Tjaden, and M. J. Flynn. Oct 72, 59p
Contract AT (11-1)-3288

Descriptors: *Computers.

For abstract, see NSA 27 06, number 14377.

LA-DC-72-1219 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
DEVELOPMENT OF THE LASL COMPUTER NETWORK.
R. D. Christman. 11p CONF-730201-1
From 7. Annual Ieee Computer Conference- San Francisco, Ca (27 Feb 1973).

Descriptors: *Computers, *Data acquisition systems.

For abstract, see NSA 27 06, number 14402.

LA-DC-72-1459 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
TOPOLOGICAL PROCESSOR TO DETERMINE THE PRESENCE OF A FRAGMENT IN AN ELECTRICAL CIRCUIT.
J. L. Clark, and R. W. Mitchell. 3p CONF-730102-1
From 6. Annual International Conference On Systems Science- Honolulu, Hi. (9 Jan 1973).

Descriptors: *Circuits.

For abstract, see NSA 27 06, number 14404.

LA-5103 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
LASL COMPUTER NETWORK.
R. D. Christman. Dec 72, 5p
Contract W-7405-ENG-36

Descriptors: *Data acquisition systems, *Data processing systems.

For abstract, see NSA 27 06, number 12213.

LA-5118 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
MCA FOCAL- A REAL-TIME PROGRAMMING SYSTEM FOR MULTICHANNEL ANALYSIS ON A PDP-9/PDP-15 COMPUTER.
L. V. East, and P. M. Aebersold. Dec 72, 17p
Contract W-7405-ENG-36

Descriptors: *Computational modular systems, *Computer programs, *Spectra.

For abstract, see NSA 27 06, number 14327.

N73-16162 PC$3.75/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
COMPUTER SOFTWARE DOCUMENTATION.
P. A. Comella. Jan 73, 34p NASA-TM-X-66161, X-641-73-4

Descriptors: *Computer systems programs, *Documentation, *Problem solving, Computer programs, Methodology.

For abstract, see STAR 11 07.

N73-16873 PC$5.00/MF$0.95
M+a Computing, Inc., Huntsville, Ala.
MULTI-PROCESSING SYSTEM STUDY.
Final Report
28 Nov 72, 60p NASA-CR-124026, REPT-72-0037
Contract NAS8-27359

Descriptors: *Data processing, *Multiprogramming, *Space stations, Computer systems programs, Data storage, Parameterization, Systems engineering.

For abstract, see STAR 11 07.

ORNL-TM-4038 PC$3.00/MF$0.95
Oak Ridge National Lab., Tenn.
COMPUTER-BASED SCANNING SYSTEM.
P. R. Bell, W. J. Mcclain, D. A. Ross, R. E. Mckeighen, and J. K. East. Jan 73, 24p
Contract W-7405-ENG-26

Descriptors: *Data acquisition systems, *Data processing systems, *Radioisotope scanners.

For abstract, see NSA 27 06, number 12008.

ORNL-4837 PC$3.00/MF$0.95
Oak Ridge National Lab., Tenn.
JOURNAL CONTROL SYSTEM BY BATCH PROCESSING AT OAK RIDGE NATIONAL LABORATORY.
A. S. Klein, and Margaret Passiakos. Jan 73, 51p
Contract W-7405-ENG-26

Descriptors: *Computer programs, *Oak ridge national laboratory.

For abstract, see NSA 27 06, number 14413.

PB-215 442/5 PC$3.00/MF$0.95
Carnegie-Mellon Univ., Pittsburgh, Pa. Inst. of Physical Planning.
FOSPLAN: A FORMAL SPACE PLANNING LANGUAGE.
Research rept.,
Chris I. Yessios. Nov 71, 12p RR-27
Grant NSF-G331188
Presented at EDRA-3/ARC Environmental Design Research Association Conference, Los Angeles, Calif. Jan 72.

Descriptors: (*Programming languages, Design), Grammars, Syntax, Time sharing, Graphic methods, Compilers, Computer programs, Architecture, Civil engineering.
Identifiers: FOSPLAN programming language, IBM 360/67 computers, Computer graphics, *Computer aided design.

FOSPLAN is a formal space planning language. It has been implemented as a batch processing system on the IBM 360/67, and runs through TSS (Time Sharing System). A HP7200A plotter is also connected to the system for graphic output. As a piece of research, it falls in the area of automated space planning such as used in building design or civil engineering. Most of the existing systems work as package programs and provide limited programming flexibility to the user. FOSPLAN, being a language, allows the user to do his own programming in solving a space planning problem. It is based on the theory of formal languages which has been extended to become applicable for two-dimensional configurations. The extensions made are (1) the specifications by which an object (defined as a rectangle representing a three dimensional empty or solid space) can be defined in a singular or iterative manner, and (2) the composition operation by which objects can be jointed in two-dimensional configurations. (Author)

PB-216 060/4 PC$3.00/MF$0.95
Illinois Univ., Urbana. Dept. of Computer Science.
THE CONCEPT OF TIME IN PROGRAMMING LANGUAGES,
Edward Neufville Adams, III. Jan 73, 48p
UIUCDCS-R-73-560

Descriptors: (*Programming languages, *Semantics), Time, Mathematical logic, ALGOL, Compilers.
Identifiers: ALGOL 60 programming language.

There are many semantic features of natural languages which are not represented in programming languages. Some of these features involve the concept of time. The feature of tense, aspect, quantification, and order seem to be useful in natural language, and might be useful in programming languages also. As an experiment, a new language is defined by embedding the distinction between future and past, and time quantification both universal (whenever) and existential (when) into ALGOL-60. These constructions add nothing to the power of the language, but add to human understanding of programs. A preprocessor is described for implementing this language, and a few programs written in the language are discussed. The advantages and disadvantages of using this language-and-implementation are discussed in detail. (Author)

SGAE-2047 PC$3.00/MF$0.95
Oesterreichische Studiengesellschaft Fuer Atomenergie G.m.b.h., Seibersdorf. Elektronikinstitut.
FOCAL CONTROLS CAMAC.
F. May, H. Halling, W. Marschik, and K. Petreczek. Oct 72, 13p
U. S. Sales only

Descriptors: *Computers.

For abstract, see NSA 27 06, number 12217.

SGAE-2049 PC$3.00/MF$0.95
Oesterreichische Studiengesellschaft Fuer Atomenergie G.m.b.h., Seibersdorf. Elektronikinstitut.
BCD-ADDITION AND SUBTRACTION WITH BINARY ADDERS.
F. May, and W. Marschik. Oct 72, 9p
Lang- In German. U. S. Sales only

Descriptors: *Circuits, *Computers.

For abstract, see NSA 27 06, number 14436.

TRG-REPORT-2300 PC$3.00/MF$0.95
United Kingdom Atomic Energy Authority, Risley (England). Reactor Group.
RISLEY 4-70 COMPUTER OPERATING SYSTEM.
C. K. Mackinnon. 1972, 49p

U. S. Sales only

Descriptors: *Computational modular systems.

For abstract, see NSA 27 06, number 14441.

UCID-15534 PC$3.00/MF$0.95
California Univ., Livermore. Lawrence Radiation Lab.
COMMON MODE REJECTION WITH GUARDING.
L. R. Allen. 18 Jul 68, 6p

Descriptors: *Circuits, *Data acquisition systems.

For abstract, see NSA 27 06, number 12218.

UCLA-10-P-14-110 PC$6.00/MF$0.95
California Univ., Los Angeles. Dept. Of Computer Science.
MULTIPROCESSORS, SEMAPHORES, AND A GRAPH MODEL OF COMPUTATION.
V. G. Cerf. Apr 72, 335p UCLA-ENG-7223
Contract AT (11-1)-GEN-10

Descriptors: *Computers.

For abstract, see NSA 27 06, number 14444.

UCLA-10-P-14-57 PC$3.00/MF$0.95
California Univ., Los Angeles. Dept. Of Engineering.
INTERFERING INSTRUMENTATION COMPUTER (THE COMPUTER-IN-LAW).
Donn Hopkins, and Gerald Estrin. 31p
CONF-690533-2
Contract AT (11-1)-GEN-10
From Spring Joint Computer Conference- Boston, Mass. (14 May 1969).

Descriptors: *Computers.

For abstract, see NSA 27 06, number 14443.

9C. Electrical and Electronic Engineering

CTC-INF-1051 PC$3.00/MF$0.95
Union Carbide Corp., Oak Ridge, Tenn. Computing Technology Center.
STUDY OF THE EFFECT OF NEGATIVE--SEQUENCE TORQUES ON INDUCTION MOTOR STABILITY.
L. R. Layman. 29 Dec 72, 97p
Contract W-7405-ENG-26

Descriptors: *Gaseous diffusion plants, *Motors.

For abstract, see NSA 27 06, number 11909.

9D. Information Theory

AD-757 109 PC$3.00/MF$0.95
Massachusetts Inst of Tech Cambridge Research Lab of Electronics
SPEECH AND PICTURE PROCESSING.
Semiannual technical rept. 1 Sep 72-15 Jan 73,
Alan V. Oppenheim. 28 Feb 73, 70p
Contract N00014-67-A-0204-0064, ARPA Order-1997
See also report dated 30 Aug 72, AD-748 212.

Descriptors: (*Speech recognition, Spectrum analyzers), (*Optical images, Data processing systems), X-ray photography, Radiography, Algorithms, Fourier analysis, Integral transforms, Pattern recognition.
Identifiers: Signal processing, Image processing, Digital filters, Digital pictures, PDP-9 computers.

During the second half of the contract year the program continued the following studies: speech analysis by linear prediction, reconstruction of multidimensional signals from projections, development of a high speed digital processor for speech synthesis, and the design of two-dimensional recursive digital filters. These projects are summarized, and reprints of available publications are appended. (Author)

AD-757 459 PC$3.00/MF$0.95
Saclant ASW Research Centre La Spezia (Italy)
STATISTICAL UNCERTAINTY OF ESTIMATING CORRELATION BETWEEN SIGNALS IN NOISE.
Technical memo.,
Eugen O. Landeide. 15 Dec 72, 26p Rept no. SACLANTCEN-TM-185

Descriptors: (*Information theory, Statistical analysis), (*Sonar signals, Correlation techniques), Uncertainty, White noise, Signal-to-noise ratio, Stochastic processes, Sound signals, Italy.
Identifiers: Signal processing, Stationary processes.

The memorandum considers the problem of estimating the correlation between two stationary random signals. The signals are known only for a finite interval of time and are corrupted by noise. Equations for the estimated correlation coefficient and the standard deviation of this coefficient are given. The application of the formulae requires that the signal has a large number of degrees of freedom within the time interval subject to analysis. Furthermore, the formulae for the standard deviation of the estimated correlation is valid only if this correlation is significantly different from zero. (Author)

AD-757 461 PC$3.00/MF$0.95
Yale Univ New Haven Conn Dept of Engineering and Applied Science
SIGNAL DESIGN FOR STOCHASTIC, LINEAR CHANNELS WITH ADDITIVE COLORED NOISE.
A. N. Venetsanopoulos, and F. B. Tuteur. Dec 72, 6p
Contract N00140-69-C-0045
Prepared in cooperation with Toronto Univ., Canada.

Descriptors: (*Information theory, Stochastic processes), Linear systems, White noise, Signal-to-noise ratio, Theorems.
Identifiers: Signal processing.

In the paper an attempt is made to design signals for stochastic, linear channels with additive colored noise under large signal-to-noise ratio conditions. The application of the theory in the case of a quasistationary channel is then outlined. (Author)

AD-757 532 PC$3.00/MF$0.95
Southeastern Massachusetts Univ North Dartmouth Dept of Electrical Engineering
A THEORETICAL COMPARISON OF STATISTICAL FEATURE SELECTION CRITERIA FOR REALTIME PATTERN RECOGNITION.
Interim scientific rept. 1 Jul 71-31 Dec 72,
Chi-hau Chen. 20 Feb 73, 12p AFOSR-TR-73-0481
Grant AF-AFOSR-2119-71
See also AD-746 737.

Descriptors: (*Information theory, Pattern recognition), (*Pattern recognition, Statistical analysis), Stochastic processes, Measure theory, Power spectra, Seismology, Errors, Real time.
Identifiers: Markov processes, Computational complexity, Signal processing.

Tight error bounds on the information measure for feature selection are obtained and shown to be better than those offered by the Bhattacharyya distance. Feature subset constructed from features ordered by the information measure is also shown to perform better. The analytical study is supported by computer simulation on handprinted characters. To meet the realtime recognition needs, the computational complexity in feature selection is considered. For features with Markov dependence, recursive computation of mutual information is available such that the computational complexity increases only linearly while the performance could be much better than available with the independent assumption. For n Markov dependent binary variables, a saving of (2 sup n)/4n in the computation time for feature subset construction is available. Other distance measures are also considered. It is concluded that the information measure is the best compromise choice as far as both the error performance and the computational complexity are concerned. Application of the theoretical study to real seismic data was started near the end of the grant period. Some preliminary analysis of the dat data is described in this report. (Author)

AD-757 538 PC$3.00/MF$0.95
Pattern Analysis and Recognition Corp Rome N Y
TIME DOMAIN ANALYSIS FOR INVERSE SCATTERING. VOLUME II. ACOUSTIC SIGNATURE ANALYSIS.
Final rept.,
John W. Sammon, Ronald M. Oelsligle, Paul Caruso, Donald H. Foley, and Leonard Bennett.
Nov 72, 74p Rept no. PAR-72-28-Vol-2 RADC-TR-72-292-Vol-2
Contract F30602-72-C-0227
See also Volume 1, AD-757 564 and Volume 3, AD-757 539.

Descriptors: (*Pattern recognition, Target discrimination), (*Acoustic detectors, Spectrum signatures), Sound signals, Information theory, Graphics, Aircraft, Vehicles, Seismology, Tables, Sensors, Automation.
Identifiers: Signal processing.

The report describes a six-month effort leading to: (1) the preliminary software design of an acoustic classifier for the automatic recognition of targets, and (2) the development of an interactive data display and analysis facility for the rapid analysis of future data bases.

AD-757 539 PC$3.00/MF$0.95
Pattern Analysis and Recognition Corp Rome N Y
TIME DOMAIN ANALYSIS FOR INVERSE SCATTERING. VOLUME III. MAGNETIC SIGNATURE ANALYSIS.
Final rept.,
John W. Sammon, Ronald M. Oelsligle, Paul Caruso, Donald H.Foley, and Leonard Bennett.
Nov 72, 215p Rept no. PAR-72-28-Vol-3 RADC-TR-72-292-Vol-3
Contract F30602-72-C-0227
See also Volume 2, AD-757 538.

Descriptors: (*Pattern recognition, Target discrimination), (*Magnetic detectors, Spectrum signatures), Electric filters, Mathematical models, Graphics, Sensors, Data processing systems, Computer programs, Magnetometers.
Identifiers: Signal processing, Feature extraction.

The report involves the extraction and definition of patterns for the eventual design of a logic. This logic will provide the capability of discriminating target classes within data collected from magnetic sensors. (Author Modified Abstract)

AD-757 546 PC$3.00/MF$0.95
Texas Univ Austin Electronics Research Center
A UNIFIED APPROACH TO DETECTION, ESTIMATION, AND SYSTEM IDENTIFICATION.
Technical rept.,
Sung Kyou Park, and Demetrios G. Lainiotis. 22 Aug 72, 205p Rept no. TR-136 AFOSR-TR-72-2013
Contract F44620-71-C-0091, Grant AF-AFOSR-1764-69

Descriptors: (*Information theory, Pattern recognition), Linear systems, Stochastic processes, Decision theory, Identification systems, White noise, Numerical analysis, Theorems, Adaptive control systems, Mathematical models.
Identifiers: Signal processing, Random processes, Markov processes, Nonlinear filtering, Parameter estimation, *Control theory, Automatic control.

A unified approach is presented for the problem of simultaneous detection of random signals in additive white Gaussian noise, estimation of the signals and identification of the systems that generate the signals. The approach is based on the state-variable representation for random processes and makes use of the Markovian nature of the state vectors. Optimal solutions are derived for the cases where both the dynamical system for the signal state and the observation data are continuous, and both the system and the observation data are discrete. Optimal solutions are presented in the form of optimal nonlinear filtering for the sufficient statistic for Bayes decision, the signal state-vector and the parameter vector that characterize the system. This problem is treated for both single shot and multishot observations of various signal sequences. In addition, the optimal state vector estimation for the linear systems where the initial state vector is non-Gaussian is presented. (Author Modified Abstract)

AD-757 564 PC$3.00/MF$0.95
Pattern Analysis and Recognition Corp Rome N Y
TIME DOMAIN ANALYSIS FOR INVERSE SCATTERING. VOLUME I. TIME DOMAIN ANALYSIS.
Final rept.,
John W. Sammon, Ronald M. Oelsligle, Paul Caruso, Donald H.Foley, and Leonard Bennett.
Nov 72, 88p Rept no. PAR-72-28-Vol-1 RADC-TR-72-292-Vol-1
Contract F30602-72-C-0227
See also AD-757 538 and AD-757 539.

Descriptors: (*Pattern recognition, Target discrimination), (*Radar targets, Target discrimination), Radar tracking, Phased arrays, Curve fitting, Graphics, Signal-to-noise ratio.
Identifiers: Signal processing.

The volume includes an analysis of waveform data representative of space objects. The purpose of this investigation was to define a set of features capable of performing discrimination. The work represented by the report addresses three problem areas. Volumes 2 and 3 involve the extraction and definition of patterns for the eventual design of a logic. This logic will provide the capability of discriminating target classes within data collected from acoustic and magnetic sensors respectively. In each case, a small data base was used to define a preliminary logic. (Author)

AD-757 602 PC$3.00/MF$0.95
Army Materiel Systems Analysis Agency Aberdeen Proving Ground Md
THE ANALYSES OF STATIONARY STOCHASTIC PROCESSES USING SPECTRAL AND AUTOREGRESSION TECHNIQUES. VOLUME I.
Technical rept.,
John N. Groff. Sep 72, 122p Rept no. AMSAA-TR-63

Descriptors: (*Information theory, Time series analysis), (*Stochastic processes, Spectrum analyzers), Power spectra, Probability density functions, Random variables, Regression analysis, Graphics, Computer programs, Tracking.
Identifiers: Stationary processes, Markov processes, FORTRAN, Spectrum analysis.

The report deals with the time and frequency domain analyses of stationary stochastic processes, i.e., a process whose statistics are time invariant over some interval of time. Algorithms and software have been developed which permit such analyses given either an ensemble of time histories which are representative of the process or merely a single time history of the process. The latter case is of particular interest since usually only limited data is available for such analyses. The report shows that if a process is gauss Markov in addition to being stationary then a single time history of sufficient length is adequate to perform frequency domain analysis or more precisely spectral analysis. The report also demonstrates the applicability of this methodology as an alternate approach to Monte Carlo simulation when suitable assumptions are satisfied. Such an application when feasible could result in a sizeable reduction in Monte Carlo budget requirements. (Author Modified Abstract)

AD-757 616 PC$3.00/MF$0.95
Army Electronics Command Fort Monmouth N J
VULNERABILITY OF CODES USING FREQUENCY SHIFT KEYING.
Research and development technical rept.,
Ray H. Pettit. Feb 73, 60p Rept no. ECOM-4048

Descriptors: (*Coding, Frequency shift keyers), Data transmission systems, Radio jamming, Frequency modulation, White noise, Probability density functions, Errors, Corrections, Band-pass filters, Electronic counter countermeasures.
Identifiers: Error correction codes, Block codes, Convolutional codes, Hamming codes, Data transmission, Signal processing.

The report contains the details and results of a study of the susceptibility of a binary noncoherent frequency shift keying (NCFSK) detection system to various types of jamming signals. Probability-of-error expressions are derived for two types of jamming signals (CW and linear FM), serving as a beginning to a more complete theoretical susceptibility analysis. The manthematical model and the procedures used provide a basis for additional derivations involving non-Gaussian interference. Seven possible error-corr ction schemes are investigated and compared on the basis of: (1) tolerable binary symbol error rates for a given character error probability, and (2) the interference power levels associated with these error rates. System complexity is considered qualitatively. Recommendations are made concerning additional studies and system modifications. (Author)

N73-16161 PC$10.00/MF$0.95
Purdue Univ., Lafayette, Ind. Lab. for Applications of Remote Sensing.
MULTISPECTRAL DATA COMPRESSION THROUGH TRANSFORM CODING AND BLOCK QUANTIZATION.
P. J. Ready, and P. A. Wintz. 1972, 159p
NASA-CR-130365,
LARS-INFORM-NOTE-050572
Contract NGL-15-005-112

Descriptors: *Data reduction, *Imaging techniques, *Remote sensors, *Transformations (mathematics), Aerial photography, Coding, Digital integrators, Multispectral band scanners, Photointerpretation, Satellite-borne photography.

For abstract, see STAR 11 07.

PAT-APPL-315070 PC$3.25/MF$0.95
BINARY CONCATENATED CODING SYSTEM.
Patent Application
L. G. Monford, Jr. Filed 14 Dec 72, 23p
NASA-CASE-MSC-14082-1
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Binary digits, *Coding, *Numerical integration, Patent applications, Pulse code modulation.

A binary notation system of measuring, counting, and recording numerical information with a minimized number of digits or bits may be better utilized than the binary pulse code modulation system or the delta modulation system. In the binary concatenated coding system, a 3-bit data word is used to count all whole numbers from zero through 99, whereas the binary system requires 7 bits. In any of the 10 decades this is accomplished by starting with a one, progressing stepwise from one to seven and then to zero in a binary fashion, thus providing eight positions corresponding to the first eight numbers of the Arabic system. The ninth and tenth positions are occupied by two of these same eight numbers so selected and arranged that they uniquely describe the decade completed by them relative to the other nine decades of the total count capability of one hundred.

9E. Subsystems

AD-757 141 PC$3.00/MF$0.95
Army Electronics Command Fort Monmouth N J
A WIDEBAND ANTENNA-IMPEDANCE SIMULATOR.
Technical rept.,
W. P. Czerwinski. Jan 73, 21p Rept no. ECOM-4074

Descriptors: (*Antenna simulators, Electrical impedance), Very high frequency, Omnidirectional antennas, Radiofrequency power, Broadband.
Identifiers: Monopole antennas.

A relatively small cylindrical chamber is described which provides the capability to simulate the operational impedance characteristics of a whip antenna throughout the frequency range 30-76 MHz. This chamber, which does not contain tuning elements, is made of an aluminum cylinder with the inner surface lined with a highly absorbing ferrite tile. To adjust the impedance-controlling networks of a wideband whip antenna, the top portion of the antenna whip is replaced by a metal disc and the assembly positioned axially within the chamber. The use of this chamber greatly simplifies tuning and power testing of the impedance controlling networks of wideband whip antennas. (Author)

AD-757 152 PC$3.00/MF$0.95
Ballistic Research Labs Aberdeen Proving Ground Md
EFFECTS OF REDUNDANCY ON SURVIVAL OF CRITICAL AVIONICS EQUIPMENT.
Memorandum rept.,
Keats A. Pullen. Jan 73, 35p Rept no. BRL-MR-2266

Descriptors: (*Power supplies, Helicopters), (*Redundant components, Vulnerability), (*Helicopters, Antiaircraft gunnery), Kill probabiliteis, Switching circuits, Electronic equipment, Electric cables.
Identifiers: Avionics, Intertie control.

The design of simple circuits capable of keeping communications equipment in operation under conditions of failure of vital sections or sub-units of a system are described. Analyses are included which indicate possible routes for improvement of equipment survivability in a battlefield-type environment. (Author)

AD-757 294 *Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
A COMPACT TUBULAR CHAMBER FOR IMPEDANCE AND POWER TESTING OF VHF WHIP ANTENNAS,
Watson P. Czerwinski, William R. Free, and Charles W. Stuckey. 14 Jan 72, 8p
Revision of report dated 10 May 71.
Availability: Pub. in IEEE Transactions on Vehicular Technology, vVT21 n3 p101-108 Aug 72.

Descriptors: (*Omnidirectional antennas, *Test equipment), Electrical impedance, Radiofrequency power, Very high frequency, Ferrites.
Identifiers: Monopole antennas.

A small-diameter tubular test chamber lined with lossy material (ferrite) has been developed for indoor tuning and testing of the base-isolation and impedance-correcting networks of a VHF whip antenna covering the frequency band from 30 to 76 MHz. Results of experimental evaluation of the chamber which attest to its usefulness in production tuning, power testing, and field maintenance servicing of the antenna assembly are presented.

AD-757 442 Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
LET A COMPUTER DESIGN YOUR I-F AMPLIFIER.
Randolph A. Reitmeyer, Jr. 1972, 5p
Availability: Pub. in Electronic Design, 16 Mar 72.

Descriptors: (*Radiofrequency amplifiers, Design), Computer programs, Integrated circuits, Field effect transistors.
Identifiers: RFAMP computer program, Computer aided design, FORTRAN, Network synthesis.

The report describes a modified FORTRAN program called RFAMP to simplify and speed the design of i-f amplifiers that use transistors and integrated circuits.

AD-757 544 PC$3.00/MF$0.95
Purdue Univ Lafayette Ind
CONTINUOUS FILTER MATHEMATICAL CONCEPTS. VOLUME I.
Technical rept.,
Benjamin J. Leon. Dec 72, 69p* RADC-TR-72-311-Vol-1
Contract F30602-72-C-0105
See also Volume 2, AD-757 545.

Descriptors: (*Electric filters, Differential equations), (*Circuits, Design), Integral transforms, Transfer functions, Complex numbers, Numerical analysis, Analog systems.
Identifiers: *Network analysis theory, Continuous time systems, Signal processing, Fourier transformation, Laplace transformation, Network synthesis.

Continuous or analog filters are electronic circuits assembled from resistors, inductors, capacitors, transistors, operational amplifiers, and other similar linear electronic circuit components. Such circuits are characterized by linear differential equations with constant coefficients. In the report, simple circuit concepts and simple mathematical concepts are tied together through the analysis of an RC lowpass filter and of a simple tuned circuit. These mathematical and circuit theoretic ideas are then generalized to any linear network. Two topics of special interest to circuit designers, the use of impulse and step functions, and the use of Laplace-Fourier transforms are related to the more classical mathematical concepts. (Author)

AD-757 545 PC$3.00/MF$0.95
Purdue Univ Lafayette Ind
CONTINUOUS FILTER MATHEMATICAL CONCEPTS. VOLUME II. DESIGN OF CONTINUOUS, LUMPED PARAMETER LINEAR FILTERS.
Technical rept.,
Benjamin J. Leon. Dec 72, 68p* RADC-TR-72-311-Vol-2
Contract F30602-72-C-0105
See also Volume 1, AD-757 544.

Descriptors: (*Electric filters, Design), Transfer functions, Bessel functions, Integral transforms, Low-pass filters, High-pass filters, Band-pass filters, Linear systems, Approximation (Mathematics).
Identifiers: Continuous time systems, Network analysis theory, Butterworth filters, Chebyshev filters, Elliptic functions, *Signal processing.

Most filters used in the separation of signals on the basis of frequency are derived by transformation of standard lowpass filter functions. These standard functions include the Butterworth, Chebyshev, Bessel Polynomial, and Elliptic Function filters. The first two and the last of these approximate the magnitude of an ideal lowpass filter. The Bessel Polynomial filter approximates the linear phase of an ideal lowpass filter. All of these prototype filters are discussed herein. To make a practical filter, one converts a lowpass prototype to a lowpass, highpass, bandpass, or bandreject filter. This final filter must have practical element values for fabrication with electronic circuit components. Problems of frequency transformation and frequency and magnitude scaling to give practical filters are discussed. Both the use of passive filters as interstage coupling networks and the design of active filters are presented. (Author)

AD-757 556 PC$3.00/MF$0.95
Continental Electronics Mfg Co Dallas Tex
EXPERIMENTAL MODEL DISPERSIBLE TRANSMITTING ANTENNA VLF/LF.
Final rept. 1 Mar-15 Oct 72,
Jan 73, 57p Rept no. 721015 RADC-TR-73-5
Contract F30602-72-C-0234

Descriptors: (*Omnidirectional antennas, Low frequency), Very low frequency, Design, Command + control systems, Radiofrequency power, Antenna radiation patterns.
Identifiers: *Perimeter current antennas.

The problem was design, installation and testing of a full scale experimental model of an antenna system no more than 100 feet high for the frequency range 27 to 60 kHz having a radiated power of 250 watts and a design goal of 300 watts. The input power is 50 kilowatts. A radiated power of 362 watts was achieved and some modifications and development were required to contain the voltages developed at 50 kilowatts of input power. The system is voltage limited somewhere above this power level depending upon the efficiency and/or bandwidth-efficiency product of the system is approximately 0.85 cycles at the lowest frequency of 27 kHz and increases as the 3.8 power of the frequency ratio. It is shown that the system can be operated at 100 kilowatts input, 250 watts radiated, 377 cycles bandwidth at a frequency of 27 kHz. (Author)

AD-757 558 PC$3.00/MF$0.95
TRW Inc Lawndale Calif Semiconductor Div
SOLID STATE AMPLIFIER LINEARIZATION TECHNIQUES FOR INTERFERENCE REDUCTION IN USAF COMMUNICATIONS SYSTEMS.
Final technical rept.,
Edward R. Moss, and Roger DeBloois. Jan 73, 96p Rept no. TRW-71-0247 RADC-TR-73-10
Contract F30602-71-C-0247

Descriptors: (*Transistor amplifiers, Ultrahigh frequency), Transistors, Linear systems, Broadband, Radiofrequency power, Power amplifiers.
Identifiers: Power transistors.

The report describes the development of thr TRW Jo2009 linear power transistor and the design of a broad band UHF amplifier using these transistors. The amplifier uses two J02009 transistors with hybrid power splitting and summing techniques to combine the two transistors. The amplifier has a bandwidth of 225 to 400 MHz, a peak envelope output power of 50 watts, and gain that varies from 8 dB to 14 dB over the band. (Author Modified Abstract)

AD-757 618 PC$3.00/MF$0.95
Army Electronics Command Fort Monmouth N J
STUDY OF TRANSIENT RADIATION EFFECTS ON A MONOLITHIC INTEGRATED CIRCUIT FERRITE PHASE SHIFTER DRIVER.
Research and development technical rept.,
Vincent J. Organic, and Henry A. Schauer. Jan 73, 31p Rept no. ECOM-4069

Descriptors: (*Phase shifters, Failure (Electronics)), (*Integrated circuits, Radiation damage), Ferrites, Semiconductor devices, Electrical properties, Gamma rays, Test methods.
Identifiers: Transient radiation effects (Electronics), Schematic diagrams, Large scale integrated circuits, Metal oxide semiconductors.

A study was performed to determine the permanent performance degradation due to transient radiation on a ferrite phase shifter driver circuit. The driver circuit contained two types of monolithic integrated circuits--a large scale integration (LSI) P-channel metal-oxide-semiconductor (P-MOS) circuit to perform the steering logic and a bipolar circuit to perform the high current analog driver function. An analysis was made to predict possible failure modes, and irradiation tests were run on sample circuits. The subsequent test results showed satisfactory circuit performance, up to an irradiation level of approximately 10 to the 13th power n/sq cm (E > or = 10 keV) and gamma radiation of 30,000 R. (Author)

AD-757 619 PC$3.00/MF$0.95
Army Electronics Command Fort Monmouth N J
COMPARISON OF THE PERFORMANCE OF A LARGE AND A SMALL DELTA ANTENNA, AND A SPIRAL LOG PERIODIC ANTENNA.
Research and development technical rept.,
Richard J. D'Accardi, and Edwin L. Roswell, III. Mar 73, 110p Rept no. ECOM-4085

Descriptors: (*Antennas, Atmospheric sounding), Antenna configurations, Spiral antennas, Log periodic antennas, Antenna radiation patterns, Gain, Standing wave ratios, High frequency, Statistical analysis, Ionosphere.
Identifiers: *Delta antennas.

Full-scale measurements were made of the elevation-plane gain patterns of in-house constructed fixed and transportable versions of the delta antenna. These antennas are primarily vertically looking radiators intended for use in ionospheric sounding. Measured patterns and theoretical considerations are presented along with details of the construction of both delta antennas and the transportable delta erection system. Included for comparison is the Granger Associates Model 798 Logarithmic Periodic Spiral Antenna. (Author)

AD-757 649 PC$3.00/MF$0.95
Office of Naval Research London (England)
PHYSICS OF DISPLAY DEVICES MEETING AT IMPERIAL COLLEGE, LONDON, 25 OCT 72.
Conference rept.,
Arthur H. Waynick. 31 Jan 73, 13p Rept no. ONRL-C-22-72

Descriptors: (*Display systems, Liquids), (*Gas discharges, Display systems), (*Ferroelectric materials, Display systems), Electrooptics, Ceramic materials, Lead compounds, Titanates, Zirconates, Plasma medium, Great Britain.
Identifiers: *Liquid crystal display systems, Lead titanates, Leas zirconates, *Plasma displays.

A report is made on a colloquim concerned with gas discharge, liquid crystal and PLZT, ferroelectric ceramic, display devices. The present status of some industrial research activities in these areas, in Europe, it also involved. (Author)

N73-16127 PC$4.75/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
COMPUTER CONTROLLED ANTENNA SYSTEM.
N. A. Raumann. Dec 72, 54p NASA-TM-X-66154, X-811-72-470

Descriptors: *Antenna components, *Digital computers, *Digital techniques, *Satellite tracking, *Steerable antennas, Digital systems, Servomechanisms, Systems engineering.

For abstract, see STAR 11 07.

N73-16135 PC$3.00/MF$0.95
Ohio State Univ., Columbus. Electroscience Lab.
HIGH PERFORMANCE S-BAND HORN ANTENNAS FOR RADIOMETER USE.
R. Caldecott, C. A. Mentzer, L. Peters, and J. Toth. Jan 73, 110p NASA-CR-2133
Contract NAS1-10040

Descriptors: *Antenna design, *Antenna radiation patterns, *Horn antennas, *Radiometers, *Superhigh frequencies, *Ultrahigh frequencies, Antenna components, Equipment specifications, Field theory (physics).

For abstract, see STAR 11 07.

N73-16142 PC$3.00/MF$0.95
Admiralty Surface Weapons Establishment, Portsmouth (England).
A PRINTED CIRCUIT ANTENNA IN THE VHF BAND.
J. E. Wyatt. Apr 72, 18p TR-72-34, BR-32391

Descriptors: *Dipole antennas, *Omnidirectional antennas, *Printed circuits, *Very high frequencies, Flat plates, Low aspect ratio.

For abstract, see STAR 11 07.

PAT-APPL-315069 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ULTRA-STABLE OSCILLATOR.
Patent Application
L. L. Kleinberg. Filed 14 Dec 72, 17p
NASA-CASE-GSC-11513-1
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Frequency stability, *Oscillators, *Piezoelectric crystals, *Transistor circuits, Crystal oscillators, High frequencies, Patent applications, Stable oscillations.

A high frequency oscillator, having both good short and long term stability, is formed by including a piezoelectric crystal in the base circuit of a first bi-polar transistor circuit, the bi-polar transistor itself operated below its transitional frequency and having its emitter load chosen so that the input impedance, looking into the base thereof, exhibits a negative resistance in parallel with a capacitive reactance. Combined with this basic circuit is an auxiliary second bi-polar transistor circuit. By this configuration, variations in the input impedance of the first bi-polar transistor are substantially cancelled thereby achieving from the oscillator a signal having its frequency of oscillation stable over long time periods as well as short time periods.

N73-16187 PC$3.00/MF$0.95
Radio Corp. of America, Princeton, N.J.
TWO-PHASE CHARGE-COUPLED DEVICE.
Final Report, 25 Jun. - 24 Dec. 1971
W. F. Kosonocky, and J. E. Carnes. Jan 73, 106p
NASA-CR-2148, PRRL-72-CR-6
Contract NAS1-10983

Descriptors: *Charge transfer, *Shift registers, *Systems engineering, Aluminum, Gates (circuits), Mathematical models, Metal oxide semiconductors, Silicon oxides, Thermal diffusion.

For abstract, see STAR 11 07.

N73-16191 PC$8.50/MF$0.95
Laboratoire Central de Recherches Thomson-csf, Orsay (France).
STUDY OF THE INFLUENCE OF NANOELECTRONIC TECHNOLOGY ON THE DEVELOPMENT AND PERFORMANCE OF RAPID LOGIC CIRCUITS USING LITTLE POWER . ETUDE DE LINFLUENCE DES TECHNOLOGIES NANOELECTRONIQUE SUR LA CONCEPTION ET LES PERFORMANCES DES CIRCUITS LOGIQUES RAPIDES A FAIBLE CONSOMMATION.
Final Report
R. Lyon-caen. 1971, 129p
Contract DEL-INF-70.80.038.00.212.75.01
Language French

Descriptors: *Computer programs, *Computerized simulation, *Electrical resistance, *Field effect transistors, *Logic circuits, Avalanche diodes, Equivalent circuits, Gates (circuits), Logic design, Quadrupoles.

For abstract, see STAR 11 07.

PATENT-3710329 Not Available - NTIS
National Aeronautics and Space Administration. Pasadena Office, Calif.
PHASE CONTROL CIRCUITS USING FREQUENCY MULTIPLICATIONS FOR PHASED ARRAY ANTENNAS.
Patent
R. J. Mailloux, and P. R. Caron. Patented 9 Jan 73, 13p NASA-CASE-ERC-10285
Filed 16 Jul. 1970 Supersedes N70-36076 (08 - 19, P 3518)
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: (*Phased arrays, Phase control), Patents.
Identifiers: PAT.CL. 343-100.

A phase control coupling circuit for use with a phased array antenna is described. The coupling circuit includes a combining circuit which is coupled to a transmission line, a frequency multiplier circuit which is coupled to the combining circuit, and a recombining circuit which is coupled between the frequency multiplier circuit and phased array antenna elements. In a doubler embodiment, the frequency multiplier circuit comprises frequency doublers and the combining and recombining circuits comprise four-port hybrid power dividers. In a generalized embodiment, the multiplier circuit comprises frequency multiplier elements which multiply to the Nth power, the combining circuit comprises four-part hybrid power dividers, and the recombinding circuit comprises summing circuits.

N73-16208 PC$3.75/MF$0.95
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
RELIABILITY OF HYBRID MICROCIRCUIT DISCRETE COMPONENTS.
R. V. Allen. Oct 72, 33p NASA-TM-X-64686
Misc 0revised Previously Announced As Nasa-tm-x-64686 N72-31275

Descriptors: *Circuits, *Component reliability, *Microelectronics, Ceramics, Data acquisition, Failure analysis, Failure modes, Semiconductor devices.

For abstract, see STAR 11 07.

N73-16738 PC$6.00/MF$0.95
Rhode Island Univ., Kingston. Dept. of Electrical Engineering.
SOLID STATE IMAGE SENSING ARRAYS.
Final Technical Report
G. Sadasiv. 1 Dec 72, 77p NASA-CR-130036
Contract NGR-40-004-022

Descriptors: *Photodiodes, *Phototransistors, *Silicon, Arrays, Imaging techniques, Metal oxide semiconductors.

For abstract, see STAR 11 07.

9F. Telemetry

PATENT-3710257 Not Available - NTIS
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
MULTICHANNEL TELEMETRY SYSTEM.
Patent
S. Butman, and U. Timor. Patented 9 Jan 73, 9p
NASA-CASE-NPO-11572
Filed 17 Mar. 1971 Supersedes N71-34159
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: (*Telemetry, Patents).
Identifiers: PAT.CL. 325-60.

A two-channel telemetry system is described in which one channel is used for high-rate data and the other channel for low-rate data communication. In the transmitter a signal, which subsequently phase modulates a carrier, is produced which is a function of at least the high-rate data, the low-rate data and the frequency of the subcarrier of the low-rate channel. In the receiver which includes a phase-locked loop, the high-rate data is detected off the receiver inphase channel output and the low-rate off the quadrature channel output.

N73-16129 PC$3.50/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
MEASUREMENT OF CHARACTERISTICS OF THE APPARATUS FOR SEPARATING PULSE--CODE MODULATION (PCM) SIGNAL IN THE UNIQUE SINGLE TELEMETRY SYSTEM (STMS).
V. V. Lavrusevich. 1972, 27p NASA-TT-F-14657, D-148
Contract NASW-2483
Tran- Transl. Into English of K Voprosu Izmereniya Kharakteristik Apparatury Vydeleniya Signala Kim V Yetms, Acad. of Sci., Inst. for Space Res., Moscow, Report D-148, 1972 30 P

Descriptors: *Pcm telemetry, *Pseudorandom sequences, *Pulse code modulation, Pulse communication, Signal to noise ratios, White noise.

For abstract, see STAR 11 07.

10. ENERGY CONVERSION (NON-PROPULSIVE)

10A. Conversion Techniques

ORNL-EIS-73-52 (VOL.1) (NO.1) PC$3.00/MF$0.95
Oak Ridge National Lab., Tenn.
NSF-RANN ENERGY ABSTRACTS. A MONTHLY ABSTRACT JOURNAL OF ENERGY RESEARCH.
M. P. Guthrie. Jan 73, 15p
Contract W-7405-ENG-26

Descriptors: *Bibliographies, *Energy.

For abstract, see NSA 27 06, number 11994.

10B. Power Sources

AD-757 065 PC$3.00/MF$0.95
Argonne National Lab Ill Engineering and Technology Div
INVESTIGATION OF LIQUID-METAL MAGNETOHYDRODYNAMIC POWER SYSTEMS.
Annual rept. 1 Nov 70-15 Apr 72,
Michael Petrick, W. E. Amend, H. C. Stevens, and P. V. Dauzvardis. Dec 72, 150p Rept no. ANL/ETD-72-06
Contracts NAonr-19-72, NAonr-7-71
Sponsored in part by Contract NAonr-12-70.

Descriptors: (*Magnetohydrodynamic generators, Liquid metals), Magnetohydrodynamics, Energy conversion, Sodium, Argon, Lithium, Helium, Performance (Engineering), Weight, Volume, Design, Mathematical models.

Detailed cycle and component analyses were carried out on liquid-metal MHD energy conversion systems to establish realistic performance limits, identify important system parameters, determine constraints imposed upon the parameters by the cycle and to identify and evaluate critical problem areas that require research and development programs. (Author Modified Abstract)

AD-757 087 PC$3.00/MF$0.95
Army Foreign Science and Technology Center Charlottesville Va
PERFORMANCE RELIABILITY CALCULATION FOR A MODULAR SOLAR THERMOELECTRIC GENERATOR,
Yu. N. Malevskii. 10 Jan 73, 8p Rept no. FSTC-HT-23-1434-72
Trans. of Geliotekhnika (USSR) n1 p16-20 1971.

Descriptors: (*Generators, *Thermoelectricity), Solar radiation, Modules (Electronics), Reliability, Semiconductor devices, USSR.
Identifiers: *Thermoelectric generators, Translations.

Analysis is given of the overall reliability of a solar energy converter unit composed of thermoelectric modules, as a function of the reliability of individual photocells and component modules. Expressions are given to determine the reliability of various module circuit designs having the modules in series, parallel and combined connections. The usefulness of redundancy in these designs is noted. Suggestions are given concerning the selection of module circuit designs most suitable for given operational requirements. (Author)

AD-757 145 PC$3.00/MF$0.95
Army Electronics Command Fort Monmouth N J
RACK-MOUNTED THERMOELECTRIC POWER SOURCE.
Technical rept.,
Andrew Herchakowski. Feb 73, 18p Rept no. ECOM-4083

Descriptors: (*Generators, *Thermoelectricity), Design, Installation, Shelters, Packaging, Alkaline cells, Power supplies, Air cooled, Tactical warfare, Communication equipment.
Identifiers: *Thermoelectric generators, Nickel cadmium batteries.

Design concepts of air-cooled rack-mounted thermoelectric no-break power generating systems, proposed for operating within an integrated shelter or van, to power tactical communication equipment are described. The results of operational tests conducted on an experimental model of an air-cooled thermoelectric system, fabricated on the basis of one of the proposed concepts, are presented. (Author)

AD-757 433 Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
DESIGN ANALYSIS OF THERMOPHOTOVOLTAIC (TPV)-GENERATOR SYSTEM,
E. Kittl, and G. Guazzoni. 1972, 4p
Availability: Pub. in Annual Proceedings Power Sources Conference (25th), May 72. Session on Thermal Energy Conversion.

Descriptors: (*Generators, Energy conversion), Photoelectric cells (Semiconductor), Infrared radiation, Infrared photoelectric cells, Germanium, Erbium compounds, Oxides.
Identifiers: *Thermophotovoltaic converters, Erbium oxides.

The 1000 Watt TPV-generator prototype design, as presented in the paper, is feasible without major breakthroughs in the state-of-the-art. It provides a significant performance improvement potential in comparison with present thermoelectric generator designs and inherently has further development potential. There is need for further component development particularly in the area of the Planar PIN-Ge cells and for a suitable Er2O3 radiator mantle structure before a prototype design can be developed. It is estimated that such a prototype model could be developed within the next two or three years.

AD-757 437 Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
MILITARIZED THERMOELECTRIC POWER SOURCES FOR TACTICAL OPERATION,
G. Guazzoni, and J. Angello. 1972, 3p
Availability: Pub. in Annual Proceedings Power Sources Conference (25th), May 72. Session on Thermal Energy Conversion.

Descriptors: (*Generators, *Thermoelectricity), Military requirements, Portable, Power supplies, Tactical warfare.
Identifiers: *Thermoelectric generators.

A standard family of thermoelectric power sources is expected to fulfill the battlefield needs for portable electrical power generation for tactical operations. The versatility of these power units will reduce equipment logistic support, in that they can be deployed in many different applications, significantly reducing the number of power sources required to support forward area operations.

AD-757 467 PC$3.00/MF$0.95
Army Foreign Science and Technology Center Charlottesville Va
OPTIMIZATION OF CONSTRUCTION OF THERMOELECTRIC COOLING BATTERIES (OPTIMIZATSIYA KONSTRUKSII TERMOELEKTRICHESKIKH OKHLAZDAYUSHCHIKH BATAREI),
V. S. Martynovskii. 29 Dec 72, 9p Rept no. FSTC-HT-23-1274-72
Trans. of Kholodinaya Tekhnika (USSR) n2 p31-35 1970.

Descriptors: (*Thermoelectricity, *Power equipment), Design, Heat transfer, Heat flux, USSR.
Identifiers: *Thermoelectric power generation, Translations.

The Russian investigation confirms the advisability of a substantial distribution of thermoelements when the condition of heat emission is unfavorable. The proposed construction of thermobattery provides for not only a substantial increase of power efficiency but also for a considerable lowering of the amount of semiconductor materials in thermobatteries owing to the possibility of using short thermoelements. (Author Modified Abstract)

AD-757 632 PC$3.00/MF$0.95
Army Mobility Equipment Research and Development Center Fort Belvoir Va
ACCEPTANCE TESTS OF 3.0-KW,60-HZ, ORGANIC, RANKINE-CYCLE POWER PLANT.
Final acceptance test Aug-Dec 71,
J. Harrison Daniel, Jr. Jan 73, 185p Rept no. USAMERDC-2049

Descriptors: (*Power equipment parts, Reliability), (*Power supplies, *Rankine cycle), Lubricants, Combustion chambers, Fuel consumption, Logic circuits, Malfunctions, Damage assessment.
Identifiers: JP-4 fuel, Evaluation.

The report covers the acceptance tests performed on a 3.0-kw, advanced development, organic, Rankine-cycle power plant developed by Thermo Electron Corporation, Waltham, Massachusetts. The acceptance tests involve the evaluation of the following: electrical output, multifuel operation, fuel consumption, size, weight, inclined operation, noise level, extreme temperature operation, and life. The report includes a description of the principal components and control logic of the set and discusses the results of the tests performed. Modifications made during the test program and suggestions to improve the design are included. (Author)

AD-757 708 PC$3.75/MF$0.95
Naval Civil Engineering Lab Port Hueneme Calif
AN EARTH HEAT SINK CONCEPT FOR UNDERGROUND POWER SOURCES.
Technical note,
S. C. Garg. Feb 73, 40p* Rept no. NCEL-TN-1261

Descriptors: (*Power plants (Establishments), *Heat sinks), Underground structures, Soils, Cooling, Heat transfer.
Identifiers: Electric power plants.

The possibility of using an earth heat sink to absorb the waste heat from an underground power plant operating in a closed cycle was investigated. Preliminary calculations based upon a transient heat conduction analysis were carried out to determine the order of magnitude of dimensions of the required heat sink. The calculations have shown that earth heat sinks may be practical and that they should be considered along with other methods of heat dissipation for underground power plants operating on a closed cycle basis over limited durations in time. (Author)

AD-757 714 PC$3.00/MF$0.95
Tyco Labs Inc Waltham Mass
A STUDY OF THE DEGRADATION OF PLATINUM BLACK FUEL CELL CATHODES.
Final technical rept.,
P. A. Malachesky, C. Leung, and H. Feng. Oct 72, 66p Rept no. C-154F
Contract DAAK02-71-C-0380

Descriptors: (*Fuel cells, Platinum), (*Electrodes, Fuel cells), (*Platinum, Electrodes), Electrochemistry, Hydrogen, Catalysts, Surfaces, Air, Electrolytes, Phosphoric acids, Sintering, Particle size, Surface area.
Identifiers: *Hydrogen air fuel cells, Platinum black, Fuel cell electrodes.

The report deals with a study of the mode of cathode electrocatalyst degradation in the H2-air phosphoric acid matrix fuel cell. The surface area changes which occur with thermal treatment of the Pt black electrocatalyst itself and as Teflon-Bonded fuel cell electrode material in air and in hot, concentrated H3PO4 electrolyte have been determined by BET, electrochemical, and X-ray techniques. The influence of such factors as temperature, electrode potential, and electrocatalyst characteristics (particle size) has been examined. Sintering of dry Pt black in air at temperatures of 100-150C results in a loss of surface area, apparently by an agglomeration of crystallites with no real increase in average grain size. Sintering in air of dry Teflon-bonded platinum black electrode material shows less marked surface area changes as compared to surface area losses in the H3PO4 electrolyte. Surface area losses are a function of electrode potential, with low anodic potentials leading to more marked losses. (Author Modified Abstract)

IAE-2087 PC$3.00/MF$0.95
Institut Atomnoi Energii, Moscow (Ussr).
AN EXPERIMENTAL STATIONARY MGD (MAGNETOHYDRODYNAMIC)-ASSEMBLY OPERATING IN ACCORDANCE WITH THE RANKINE CYCLE (CONSTRUCTION AND TECHNOLOGICAL PROBLEMS).
E. P. Velikhov, Yu. A. Kareev, V. T. Karpukhin, A. I. Karasev, and A. I. Kol'chenko. 1971, 28p
Lang- In Russian. U. S. Sales only

Descriptors: *Magnetohydrodynamic generators, *Power cycles.

For abstract, see NSA 27 06, number 11894.

N73-16031 PC$4.25/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
EFFECTS OF PROTON IRRADIATION AND TEMPERATURE ON 1 OHM-CM AND 10 OHM--CM SILICON SOLAR CELLS.
C. Nicoletta. Jan 73, 42p NASA-TM-X-66169, X-765-73-25

Descriptors: *Proton irradiation, *Solar cells, *Temperature effects, Fluence, Helios project, Silicon, Solar simulators, Van de graaff accelerators.

For abstract, see STAR 11 07.

N73-16639 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CORRELATION OF EXPERIMENTAL PERFORMANCE DATA FOR A CVD TUNGSTEN--NIOBIUM, PLANAR THERMIONIC CONVERTER.
P. M. Sockol. Feb 73, 14p NASA-TM-X-2716, E-7194

Descriptors: *Niobium alloys, *Performance tests, *Thermionic converters, *Tungsten alloys, Cesium diodes, Thermionic emitters, Thermionic power generation, Volt-ampere characteristics.

For abstract, see STAR 11 07.

Y-EC-144 PC$3.00/MF$0.95
Oak Ridge Y-12 Plant, Tenn. (Usa).
CLEAN ELECTRICAL POWER.
H. G. Smith. Dec 72, 8p CONF-721130-27
Contract W-7405-ENG-26
From Precision Machining And Gaging Conference, Oak Ridge, Tn (14 Nov 1972).

Descriptors: *Power supplies.

For abstract, see NSA 27 06, number 14467.

10C. Energy Storage

AD-757 296 Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
PRIMARY-SECONDARY BATTERY HYBRID SYSTEMS,
Martin J. Sulkes. 1972, 5p
Availability: Pub. in Annual Proceedings, Power Sources Conference (25th), Session on Secondary Batteries, May 72.

Descriptors: (*Primary cells, Reliability (Electronics)), (*Storage batteries, Reliability (Electronics)), Transmitter-receivers.
Identifiers: Nickel cadmium batteries, Mercury zinc cells, Magnesium manganese oxide cells.

The report discusses the hybridization of primary batteries, such as Zn-HgO, Mg-MnO2, and zinc-air with miniature sealed nickel cadmium batteries. This results in a power source that can operate synergistically over a much wider range of temperature and discharge rates with higher energy and power densities than either battery can produce alone.

AD-757 297 Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
PORTABLE HYDRAZINE-AIR FUEL CELLS,
Leonard J. Rogers. 1972, 4p
Availability: Pub. in Annual Proceedings, Power Sources Conference (25th), Session on Fuel Cells, May 1972.

Descriptors: (*Fuel cells, Reliability (Electronics)), Hydrazine, Portable, Design, Air.
Identifiers: *Hydrazine air fuel cells.

The development of a portable hydrazine-air fuel cell was initiated in response to a need for continuously available, long term power for communications and electronics equipments in forward area environments. The present configuration of the 60-watt, 28 V dc system evolved from the earlier exploratory and advanced development phases. The operation of this cell is described.

AD-757 318 Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
SESSION ON PRIMARY BATTERIES. ORGANIC ELECTROLYTE BATTERIES,
Nicholas T. Wilburn. 1972, 3p
Availability: Pub. in Annual Proceedings Power Sources Conference (25th), 3p May 72.

Descriptors: (*Storage batteries, Lithium), (*Primary cells, Lithium), Reviews, Reliability (Electronics), Storage, Thermal stability.
Identifiers: *Lithium cells, *Organic batteries.

The lithium-organic electrolyte battery is one of the major current development areas in power sources. This battery has been of great interest for many years because of its potentially high energy density. In the last two years it has been shown as well to have the rate, temperature, and storage characteristics to make it a practical and highly desirable power source. The report reviews this battery and its performance characteristics.

AD-757 438 Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
METAL-AIR (OXYGEN) BATTERIES,
Otto C. Wagner. 1972, 4p
Availability: Pub. in Annual Proceedings Power Sources Conference (25th), May 72. (Session on Secondary Batteries).

Descriptors: (*Storage batteries, Reliability (Electronics)), Electrodes, Air, Zinc, Cadmium.
Identifiers: *Metal air batteries, *Zinc air cells, *Cadmium air cells.

Cells using the zinc-air system can be designed to give an energy density of 75 Wh/lb. The cost of cell components is inexpensive. The energy density of experimental sealed zinc-oxygen cells has approached 60 Wh/lb. However, at the present time, both types of zinc cells have a limited cycle life because of the limitations of the separator materials and the zinc electrode. The cadmium-air cell has demonstrated an energy density of 45 Wh/lb and a useful life of at least 500 cycles. The drawback for major use of this system is that the cost of cell components is rather expensive if the bifunctional platinum-catalyzed air cathodes are employed. The report describes the operation of these batteries. (Author Modified Abstract)

AD-757 440 Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
CAPABILITIES OF MECHANICALLY RECHARGEABLE ZINC AIR BATTERIES,
Stephen J. Bartosh. 1972, 3p
Availability: Pub. in Annual Proceedings Power Sources Conference (25th), May 72.

Descriptors: (*Storage batteries, Zinc), Air, Reliability (Electronics), Temperature.
Identifiers: *Metal air batteries, *Zinc air cells, *Mechanically rechargeable batteries, BA-525 ()/U batteries, BA-528 (u)/U batteries.

Data obtained on the 24 V, 20 Ah BA-525 ( )/U Battery mechanically rechargeable batteries are well suited for operation under continuous discharge conditions. The factors which affect performance under this type of discharge regime are the rate of discharge and the ambient temperature. The report discusses this performance.

AD-757 535 PC$3.00/MF$0.95
Gulton Industries Inc Hawthorne Calif Engineered Magnetics Div
MAINTENANCE FREE BATTERY SYSTEM, MODEL NO. EMBC114C. BATTERY SYSTEM, SEALED CELL, NICKEL CADMIUM, INTEGRAL CHARGE CONTROL, AIRCRAFT.
Final rept.,
Thomas W. Grasmehr, William Newman, and Thomas Pierce. Dec 72, 243p AFAPL-TR-72-85
Contract F33615-70-C-1737

Descriptors: (*Aircraft equipment, *Storage batteries), (*Power supplies, Aircraft equipment), Logic circuits, Battery chargers, Reliability (Electronics), Wiring diagrams, Design, Maintenance.
Identifiers: *Nickel cadmium batteries.

The program covers work performed on the EMBC114C Maintenance Free, Nickel-Cadmium Battery System. The EMBC114C consists of a hermetically sealed nickel-cadmium battery and an associated control logic and charger circuit. The Battery System is compatible with existing aircraft electrical systems and may be operated at altitudes up to 100,000 feet. The system is a two-terminal device connected in parallel with the aircraft 28 vdc power. This system was modified to reduce EMI and minimize bus power interruptions when switching from charge to discharge. Tests were performed to verify these modifications. A study was conducted to determine the best charge rate, whether sealed or vented cells were most suitable, and the advisability of using three terminal systems where possible. The EMBC114C is the modified system in accordance with the stated objectives and was qualification tested.

N73-16032 PC$16.00/MF$0.95
Honeywell, Inc., Montgomeryville, Pa. Power Sources Center.
HIGH ENERGY DENSITY PRIMARY BATTERIES.
Final Report
R. J. Horning, and W. R. Beck. 2 Oct 72, 277p
NASA-CR-120857
Contract NAS3-13221

Descriptors: *Electrochemistry, *Factorials, *High energy interactions, Copper compounds, Fluorides, Lithium compounds.

For abstract, see STAR 11 07.

PAT-APPL-325784 PC$3.00/MF$0.95
RECONSTITUTED ASBESTOS MATRIX.
Patent Application
H. Mcbryar. Filed 22 Jan 73, 18p
NASA-CASE-MSC-12568-1
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Asbestos, *Fuel cells, Electrochemical cells, Mechanical properties, Patent applications.

The production of an asbestos matrix is descirbed suitable for use in a fuel cell or electrolysis cell. It has a greater porosity and bubble pressure for a given thickness, improved homogene-ity, and more uniform thickness than heretofore known. The matrix is produced by first shredding the asbestos; forming a slurry of the asbestos with water or a low boiling hydrocarbon, preferably an alcohol such as methanol; forming a mat by passing the slurry through a properly sized porous plaque; drying the mat so produced; and rolling the mat to yield the desired thickness and surface finish.

PB-216 622/1 PC$3.00/MF$0.95
Little (Arthur D.), Inc., Cambridge, Mass.
ELECTROCHEMICAL POWER SOURCES FOR ELECTRIC HIGHWAY VEHICLES.
Final rept.,
J. H. B. George. Jun 72, 29p* ADL-C-74692 DOT-TSC-OST-73-1

Contract DOT-TSC-4044

Descriptors: (*Electric vehicles, Power supplies), (*Storage batteries, Electric vehicles), (*Fuel cells, Electric vehicles), Automobiles, Reviews, Lead acid batteries, Metal air batteries.
Identifiers: *Hybrid vehicular propulsion, Iron nickel cells, High energy batteries, Lithium cells, Zinc cells, Hydrocarbon air fuel cells.

The report summarizes an assessment of electrochemical power sources (batteries and fuel cells) which are relevant to electric vehicle propulsion. A very brief description of each type of cell is given along with its present level of research.

SC-DC-72-1548 PC$3.00/MF$0.95
Sandia Labs., Albuquerque, N. Mex.
SOLID ELECTROLYTE THERMAL BATTERY.
D. A. Nissen, and R. W. Carlsten. 1972, 17p
CONF-720955-1
From Advanced Study Institute On Fast Ion In Solids-solid State Batteries And Devices-Belgirate, Italy (14 Sep 1972).

Descriptors: *Batteries.

For abstract, see NSA 27 06, number 14425.

SC-RR-720215 PC$3.00/MF$0.95
Sandia Labs., Albuquerque, N. Mex.
ORGANIC ELECTROLYTE BATTERY STUDY.
S. C. Levy. Dec 72, 70p

Descriptors: *Storage batteries.

For abstract, see NSA 27 06, number 14430.

11. MATERIALS

11A. Adhesives and Seals

N73-16518 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
QUASI-ONE-DIMENSIONAL COMPRESSIBLE FLOW ACROSS FACE SEALS AND NARROW SLOTS. 2 COMPUTER PROGRAM.
J. Zuk, and P. J. Smith. Aug 72, 99p
NASA-TN-D-6787, E-6305

Descriptors: *Computer programs, *Fluid flow, *Laminar flow, *Packings (seals), *Turbulent flow, Coefficient of friction, Fluid boundaries, Fluid dynamics, Numerical analysis.

For abstract, see STAR 11 07.

N73-16524 PC$6.00/MF$0.95
Pratt and Whitney Aircraft, East Hartford, Conn.
LABYRINTH SEAL TESTING FOR LIFT FAN ENGINES.
L. J. Dobek. Feb 73, 78p NASA-CR-121131, PWA-TM-4593
Contract NAS3-14409

Descriptors: *Gases, *Leakage, *Lift fans, *Seals (stoppers), *Turbine engines, Air flow, Stators, Temperature distribution.

For abstract, see STAR 11 07.

11B. Ceramics, Refractories, and Glasses

AD-757 118 PC$3.00/MF$0.95
Gulf Electronic Systems San Diego Calif
CARBON RESEARCH.
Semiannual technical rept. 1 Jul-31 Dec 72,
Robert J. Akins, James L. Kaae, Karl Koyama, Robert J. Price, and Hong S. Shim. 31 Jan 73, 49p* Rept no. Gulf-EL-A12500
Contract DAHC15-71-C-0282, ARPA Order-1861

See also report dated 25 Aug 72, AD-748 223.

Descriptors: (*Carbon, *Fluidized bed processes), (*Deposition, Carbon), Silanes, Propanes, Silicon compounds, Pyrolysis, Thermal conductivity, Thermal expansion, Wear resistance, Fatigue (Mechanics).
Identifiers: *Carbonization, *Chemical vapor deposition, *Glassy carbon.

The objective of the present program is to investigate the deposition process in steady-state fluid beds in order to gain a better understanding of the origin of the crystal structure and morphology of a wide range of isotropic pyrolytic carbons. The report presents results on the following areas: Fluidized bed deposition studies; Structural studies; Thermal expansivity of silicon-alloyed pyrolytic carbons; Thermal conductivity of silicon-alloyed pyrolytic carbons; Fatigue; Wear caused by pure carbon disks rubbing on various carbon and metal flats; Wear caused by silicon-alloyed carbon disks; and Wear caused by metal disks rubbing on various carbon flats.

AD-757 333 PC$3.00/MF$0.95
Naval Ordnance Lab., White Oak, Md.
STRENGTHENING OF GLASS BY AN ELECTROIONIC TECHNIQUE.
Final rept.,
Donald A. Kubose, and Henry A. Perry and John E. Tydings. 15 Dec 72, 30p* Rept no. NOLTR-72-290

Descriptors: (*Glass, *Ion exchange), Mechanical properties, Ions, Potassium, Solutions, Surfaces, Cracks, Hemispherical shells, Spheres, Impregnation.
Identifiers: *Ion impregnation, Fused salts.

An electroionic strengthening process for glass which produces a relatively deep surface compressive layer to preserve this strength has been examined. The process consists of using an electric field to drive large alkali ions from a molten salt bath into the glass to replace the small resident alkali ions. This exchange of ions, carried out at temperatures below the strain point of the glass, produces a compression stress on the glass surface and hence strengthens the glass. Alkali-aluminosilicate glass hemispheres (7.6 an OD, 0.4 cm. thick) and cylinders (4.7 cm diameter, 4.4 cm long) were strengthened using postassium ions from a molten potassium nitrate bath. Maximum compressive stresses on the order of 1,000,000 psi and treatment depths of 0.65 mm were obtained for the cylindrical specimens. Although high strengths were also obtained for the hemispherical specimens there was a large variation in the measured strengths in addition to a very high incidence of specimen there was a large variation in the measured strengths in addition to a very high incidence of specimen breakage during treatment. Oxygen and hydroxyl ion attack accelerated the growth of cracks. (Author Modified Abstract)

AD-757 617 PC$3.00/MF$0.95
Army Electronics Command Fort Monmouth N J
A STUDY OF LEAD BARIUM NIOBATE ADDITIONS TO LEAD ZIRCONATE TITANATE PIEZOELECTRIC CERAMICS.
Technical rept.,
Robert J. Fischer. Jan 73, 23p* Rept no. ECOM-4068

Descriptors: (*Piezoelectric crystals, *Phase studies), (*Zirconates, Phase studies), (*Niobates, Phase studies), (*Titanates, Phase studies), (*Resonators, Piezoelectric crystals), Solid solutions, Tables, Perovskites, Phase diagrams.
Identifiers: *Lead zirconates, *Lead titanates, *Lead niobates.

A survey is given on the development of piezoelectric lead zirconate titanate ceramics by the addition, modification, and substitution of lead niobate. Work by this laboratory, aimed at improved ceramic resonator materials, is reported in particular, additions of lead barium niobates to lead zirconate titanate. The limited solid solubility of lead barium niobate in lead zirconate titanate was found responsible for the poor piezoelectric response observed with these ceramics. A literature survey indicates that the widest range of solid solution with useful piezoelectric properties is formed by substitution of lead niobates with perovskite structure into lead zirconate titanate with tetragonal or rhombohedral structure. (Author)

COO-1591-21 PC$3.00/MF$0.95
Utah Univ., Salt Lake City. Div. Of Materials Science And Engineering.
IMPURITY EFFECTS ON THE CREEP OF POLYCRYSTALLINE MAGNESIUM AND ALUMINUM OXIDES AT ELEVATED TEMPERATURES. TECHNICAL PROGRESS REPORT, DECEMBER 19, 1971-DECEMBER 18, 1972.
R. S. Gordon. Dec 72, 28p UTEC-MSE-72-197
Contract AT (11-1)-1591

Descriptors: *Aluminum oxides, *Magnesium oxides.

For abstract, see NSA 27 06, number 14368.

LA-5123 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
CMB-13 RESEARCH ON CARBON AND GRAPHITE. REPORT NO. 21, SUMMARY OF PROGRESS, FEBRUARY 1-APRIL 30, 1972.
M. C. Smith. Dec 72, 12p
Contract W-7405-ENG-36

Descriptors: *Carbon, *Graphite, *Organic compounds/ metallo-.

For abstract, see NSA 27 06, number 12570.

N73-16580 PC$4.00/MF$0.95
Battelle Memorial Inst., Richland, Wash. Pacific Northwest Labs.
EFFECTS OF ADDITIVES ON VOLUME CHANGE ON MELTING, SURFACE TENSION, AND VISCOSITY OF LIQUID ALUMINUM OXIDE.
J. L. Bates, and J. J. Rasmussen. 1 Jun 72, 40p
NASA-CR-120910
Contract NAS3-14308

Descriptors: *Additives, *Aluminum oxides, *Interfacial tension, *Melting points, *Viscosity, Chemical properties, Liquids, Oxides.

For abstract, see STAR 11 07.

N73-16659 PC$3.00/MF$0.95
Departement Detudes Et de Recherches en Technologie Spatiale, Toulouse (France).
PROFILE AND DEPTH OF MICROCRATERS FORMED IN GLASS.
J. C. Mandeville. Dec 72, 9p ONERA-NT-01-14-72

Descriptors: *Glass coatings, *Hypervelocity impact, *Hypervelocity projectiles, *Projectile cratering, Depth measurement, Mirrors, Photomicrography, Terminal ballistics.

For abstract, see STAR 11 07.

11C. Coating, Colorants, and Finishes

AD-757 707 PC$3.00/MF$0.95
Naval Civil Engineering Lab Port Hueneme Calif
MAGNETIC PIGMENTATION IN PAINT.
Technical note Jul 71-Jun 72,
Carl V. Brouilette. Jan 73, 12p* Rept no. NCEL-TN-1260

Descriptors: (*Plastic paints, Magnetic properties), (*Pigments, Magnetic properties), Epoxy plastics, Coatings, Steel, Underwater, Coal tar.

Several catalytically cured coatings can be applied to wet steel surfaces, but cannot be applied to steel surfaces completely immersed in seawater. The concept of using magnetic particles as part of the pigmentation and applying to paint under water to magnetized steel was investigated. Promising results were obtained from a magnetically pigmented epoxy and coal-tar epoxy. However, methods for inducing a stronger magnetic charge on the steel substrate are necessary. It is recommended that additional coatings, types of magnetic particles and methods to produce stronger magnetic charge on the steel substrate be investigated. (Author)

AD-757 709 PC$3.00/MF$0.95
Naval Civil Engineering Lab Port Hueneme Calif
PRIMERS FOR AUTOMOBILE REFINISHING.
Final rept. Jul 71-Jul 72,
Carl V. Brouillette. Mar 73, 16p Rept no. NCEL-TN-1265

Descriptors: (*Paint primers, Passenger vehicles), Maintenance, Plastic paints, Ceramic coatings, Silicone plastics.

The investigation compared various primers and finish coats and showed that gloss retention was improved by use of a quick drying primer coating, MIL-C-8585A. A silicone-alkyd finish coat, MIL-C-46141, was found preferable to the specified alkyd enamel finish, TT-E-489F. A regularly scheduled washing and waxing is necessary to maintain a continued desirable aesthetic appearance. (Author Modified Abstract)

CEA-CONF-2080 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Grenoble (France). Centre D'Etudes Nucleaires.
USE OF POROUS COATINGS ON THE WALLS OF CONDENSERS AND EVAPORATORS OF THERMAL MACHINES.
R. Moracchioli. 2p CONF-720463-1
Lang- In French. From Conference Of The French Society Of Thermists- Toulouse, France (27 Apr 1972). U. S. Sales only

Descriptors: *Coatings, *Power cycles.

For abstract, see NSA 27 06, number 11917.

N73-16575 PC$3.50/MF$0.95
Boeing Co., Seattle, Wash. Aerospace Group.
DEVELOPMENT OF SPACE STABLE SEMITRANSPARENT POLYQUINOXALINE FILMS.
Final Report, 10 Dec. 1971 - 24 Nov. 1972
P. M. Hergenrother. 24 Nov 72, 28p
NASA-CR-112213
Contract NAS1-11255

Descriptors: *Polymers, *Polyquinoxalines, *Protective coatings, Aerospace engineering, Chemical reactions, Thin films.

For abstract, see STAR 11 07.

N73-16922 PC$5.75/MF$0.95
IIT Research Inst., Chicago, Ill. Technology Center.
DEVELOPMENT OF SPACE STABLE THERMAL CONTROL COATINGS FOR USE ON LARGE SPACE VEHICLES.
Triannual Report, 1 May - 31 Aug. 1972
J. E. Gilligan. 25 Sep 72, 73p NASA-CR-124003, IITRI-C6233-20
Contracts NAS8-26791, IITRI PROJ. C6233

Descriptors: *Spacecraft components, *Temperature control, *Thermal control coatings, *Thermal insulation, Materials tests, Product development, Thermodynamic properties.

For abstract, see STAR 11 07.

SLA-73-24 PC$3.00/MF$0.95
METHOD OF OBTAINING NIOBIUM-CARBIDE POWDER AND COATINGS FROM THE GAS-VAPOR PHASE.
T. A. Lyudvinskaya, V. S. Sinel'nikova, T. Ya. Kosolapova, and V. P. Sergeev. 10p

Descriptors: *Carbon tetrachloride, *Hydrogen, *Niobium carbides, *Niobium chlorides.

For abstract, see NSA 27 06, number 12400.

11D. Composite Materials

AD-757 063 PC$3.00/MF$0.95
United Aircraft Research Labs East Hartford Conn
FIBER REINFORCED CERAMIC MATRIX COMPOSITES.
Final rept. 15 Jan 72-15 Jan 73,
J. J. Brennan, and M. A. De Crescente. 15 Jan 73, 73p* Rept no. M911294-4
Contract N00019-72-C-0377

Descriptors: (*Composite materials, Ceramic materials), Silicon compounds, Nitrides, Tungsten, Tantalum, Fibers, Reinforcing materials, Gas turbines, Impact shock, Shock resistance, Oxidation, Rupture.
Identifiers: *Ceramic composites, Tungsten reinforced composites, Fiber composites, Silicon nitrides.

Tungsten reinforced silicon nitride was found to increase the elevated temperature (1300C) Charpy impact strength by a factor of nine over monolithic Si3N4, primarily due to the energy absorbing mechanism of fiber pullout. However, the room temperature Charpy impact strength of tungsten reinforced Si3N4 is not increased over that of monolithic Si3N4 due to the brittle nature of the silicide reaction product at the Si3N4-W interface and the notch sensitivity of tungsten. Tantalum wire reinforced Si3N4 was found to increase the room temperature Charpy impact strength of Si3N4 by a factor of 30 (0.5 ft-lbs to 14.8 ft-lbs) and also to affect the mode of failure such that interfacial splitting along with ductile fiber elongation occurs, resulting in very small fragments of matrix breaking off upon impact. This mode of fracture is desirable for use in gas turbine engines. (Author Modified Abstract)

AD-757 140 PC$3.00/MF$0.95
Army Electronics Command Fort Monmouth N J
RADIATIVE HEAT TRANSFER THROUGH COMPOSITE MATERIALS.
Technical rept.,
I. N. Greenberg, and P. G. Klemens. Dec 72, 15p Rept no. ECOM-4065

Descriptors: (*Composite materials, *Heat transfer), Porous materials, Powders, Foams, Fibers, Thermal insulation, Thermal conductivity, Thermal radiation.
Identifiers: Radiative transfer.

Radiative heat transfer in inhomogeneous materials is governed by the photon mean free path. For long-wave photons, the mean free path depends on the size and shape of the individual grains and, where applicable, of the voids. Long-wave photons have long mean free paths and play an important role in the heat transfer. In some cases they cause the radiative thermal conductivity at moderately high temperatures to be larger than one would expect by extrapolating from highest temperatures (above 2000K) according to a (T cubed) law. Some special cases are treated including polycrystalline solids, densely packed powders, foams and fibrous aggregates. (Author)

AD-757 213 PC$3.75/MF$0.95
Midwest Research Inst Kansas City Mo
FATIGUE OF BORON-ALUMINUM COMPOSITES.
Technical rept. 1 Apr 71-31 Mar 72,
J. R. Hancock. Nov 72, 33p* AFML-TR-72-113
Contract F33615-71-C-1379

Descriptors: (*Composite materials, Fatigue (Mechanics)), (*Aluminum alloys, Composite materials), Boron, Reinforcing materials, Silicon carbides, Refractory coatings, Filaments, Crack propagation, Interfaces.
Identifiers: *Boron reinforced ocmposites, *Aluminum matrix composites, Aluminum alloy 6061, Fatigue tests.

The mechanisms of fatigue failure in composites of boron-6061 aluminum under oscillating tensile loads were determined and a phenomenological model of fatigue failure is outlined. A linear relationship between fatigue limit and filament content is suggested as an interim criterion for the specification of minimum acceptable composite fatigue properties and for use in the design of structures. Unidirectional filament reinforcement was less effective under cyclic loads then under static loads, and the low-cycle resistance of the composites was sharply reduced when SiC-coated filaments were used as the reinforcements. (Author Modified Abstract)

AD-757 380 PC$3.00/MF$0.95
Solar San Diego Calif
TUNGSTEN FIBER REINFORCED OXIDATION RESISTANT COLUMBIUM ALLOYS.
Final rept. 9 Dec 71-9 Feb 73,
Mark J. Klein, and Arthur G. Metcalfe. Feb 73, 74p* Rept no. RDR-1727-4
Contract N00019-72-C-0230

Descriptors: (*Composite materials, *Niobium alloys), (*Gas turbines, Niobium alloys), Tungsten alloys, Reinforcing materials, Coatings, Corrosion inhibition, Corrosion resistance, Silicides, Mechanical properties, Filaments.
Identifiers: *Tungsten reinforced composites, *Metal matrix composites, Niobium alloy 4Al 9Cr 40Ti, Niobium alloy 4Al 4Cr 42Ti 1V, Tungsten alloy 3Re.

High-strength, oxidation-resistant composites were developed for use in turbine engines at 2000F. A composite system with columbium alloy matrices and tungsten filaments was selected and evaluated for oxidation resistance and mechanical properties. These composites were intended for use in the coated condition with the oxidation-resistant matrix providing fail-safe protection. The coated composite with 27 volume percent reinforcement had excellent stress-rupture strength (100-hour rupture strength of 25 ksi at 2200F), elevated-temperature strength (33 ksi at 2600F), and isothermal-oxidation life (>1100 hours at 2000F). However, both the fail-safe life (e.g., 50 one-hour cycles at 2000F) varied with the composition of the matrix. With continued work, it should be possible to tailor the properties of this composite system so that desired properties can be optimized for specific high-temperature applications. (Author)

AD-757 404 PC$3.00/MF$0.95
Ministry of Defence London (England) Director of Research Materials 2 (Air Systems)
VISCOELASTIC PROPERTIES OF SILICA FIBRE REINFORCED EPOXIDES AND A THEORY OF FRACTURE OF FIBRE REINFORCED VISCOELASTIC MATERIALS.
R. G. C. Arridge. Jan 72, 80p Rept no. D Mat-178
DRIC-BR-28315

Descriptors: (*Reinforced plastics, Viscoelasticity), Epoxy plastics, Silicon dioxide, Ceramic fibers, Fracture (Mechanics), Damping, Great Britain.
Identifiers: *Epoxy matrix composites, *Silicon dioxide reinforced composites, Oriented fiber composites.

The report describes the measurement of shear modulus and damping of epoxy resin samples unidirectionally reinforced with silica fibers. The measurements were performed over a temperature range including the glass-rubber transition of the resin on samples cut with fibers at various angles to the specimen axis. Fiber concentrations up to 74% were used. The report presents a theory of fracture of unidirectional fiber reinforced materials in which the rate at which elastic energy, released by fiber breakage, can be absorbed, is calculated. Analogies of fiber reinforcement theory and chain fracture theories in polymers are discussed. (Author Modified Abstract)

AD-757 524 PC$6.00/MF$0.95
IIT Research Inst Chicago Ill
DEVELOPMENT OF ENGINEERING DATA ON THE MECHANICAL AND PHYSICAL PROPERTIES OF ADVANCED COMPOSITES MATERIALS.
Interim technical rept. 1 Jun 71-31 May 72,
Kenneth E. Hofer, P. N. Rao, and V. E. Humphreys. 1 Sep 72, 529p* Rept no. IITRI-D6063 AFML-TR-72-205-Pt-1
Contract F33615-71-C-1713

Descriptors: (*Composite materials, Physical properties), (*Aluminum alloys, Composite materials), (*Titanium alloys, Composite materials), (*Reinforced plastics, *Epoxy plastics), Reinforcing materials, Boron, Graphite, Silicon carbides, Mechanical properties, Thermal expansion, Thermal conductivity, Data, Airframes.
Identifiers: Aluminum alloy 6061, Titanium alloy 6Al 4V, *Aluminum matrix composites, *Titanium matrix composites, *Boron reinforced composites, *Boron reinforced plastics, Graphite reinforced composites.

The development of engineering data for advanced composite materials is an important step in the development of new improved hardware for future aerospace applications. With this major goal in view, the present program was initiated to generate basic data on the effect of various environmental variables on the physical, thermal, and mechanical properties of selected resin matrix and metal matrix materials. The three resin matrix materials systems are Boron/Avco 5505, Modmor II Graphite/Narmco 5206 and Courtaulds HMS Graphite/Hercules 3002M systems. The two metal matrix materials systems are 6061 Aluminum/Boron and 6Al-4V - Titanium/BorSiC Composites. The resin matrix systems were procured in the form of prepreg tapes and specimens were fabricated at IITRI materials laboratory. The metal matrix composites were fabricated by vendors in laminate form and supplied to IITRI for specimen fabrication and testing. (Author)

AD-757 723 PC$3.00/MF$0.95
Artech Corp Falls Church Va
EVALUATION OF MULTILAYER THIN FILMS.
Final rept. 28 Aug 72-17 Jan 73 on Phase 3,
Fred Ordway. Mar 73, 28p Rept no. J7114.07-FR
Contract DAAK02-72-D-0223
See also report on Phase 2 dated Feb 73, AD-757 582.

Descriptors: (*Laminates, Films), Metal films, Aluminum, Titanium, Alumina, Tensile properties, Vapor plating, Vacuum apparatus, Deposition.
Identifiers: Thin films.

Multilayer thin-film structures were prepared and tested for strength by the bulge test and, in some cases, by uniaxial tensile testing on an Instron machine with a specially designed adapter. The calculated strengths of Al2O3-metal specimens ranged up to 113 kpsi. Those of aluminum-copper specimens ranged from 47 to 109 kpsi, while thin single films of copper alone gave 138-328 kpsi. Bulge testing of thin blown borosilicate glass gave values of calculated stress and strain lying on straight lines with positive intercepts on the stress axis, and coincidence of curves for increasing and decreasing test pressure showed that the specimens behaved elastically. (Author Modified Abstract)

11E. Fibers and Textiles

AD-757 209 PC$3.00/MF$0.95
Aeronautical Systems Div Wright-Patterson AFB Ohio
TEST AND EVALUATION OF DOUBLE BRAIDED NYLON ROPE EXTRACTION LINES.
Final technical rept. Dec 67-Jan 72,
Lawrence E. Fielding. Dec 72, 67p Rept no. ASD-TR-72-80

Descriptors: (*Cordage, Reliability), (*Air drop operations, Cargo parachutes), Nylon, Test methods, Acceptability, Flight testing, Tolerances (Mechanics), Wear resistance, Loading (Mechanics).
Identifiers: *Double braided nylon ropes, *Extraction lines, Evaluation.

The current technique of using multiple layers of flat nylon webbing for construction of extraction lines has proven to require considerable detail to fabricate, is unwieldy in large sizes, and does not have a long service life. Multiple layered extraction lines when bent over connecting hardware pins fail to achieve uniform loading throughout the plies. Therefore, additional plies are needed to compensate for the strength loss. These deficiencies have promoted an investigation into using commercially available nylon double braided rope as extraction lines. This report describes the various tests performed on the nylon rope which project some operational advantages and indicate suitability of the nylon double braided rope extraction line. (Author Modified Abstract)

AD-757 659 PC$3.00/MF$0.95
Naval Ordnance Lab White Oak Md
SILICON CARBIDE WHISKERS ON CARBON FIBERS TO IMPROVE RESIN ADHESION,
Robert A. Simon. 24 Jan 73, 34p Rept no. NOLTR-73-7

Descriptors: (*Silicon carbides, *Whiskers (Crystals)), (*Carbon fibers, Deposits), (*Reinforcing materials, Carbon fibers), Coatings, Impregnation, Bonding, Composite materials, Mechanical properties.

'Whiskerizing' is a process to deposit silicon carbide whiskers on carbon fibers to increase resin adhesion to the fibers. Whiskerized fibers in composites gave short beam shear strengths to 6900 n/sq cm (10,000 psi) compared to 2800 n/sq cm (4000 psi) for as-received (unwhiskered) fibers in composites. But whiskerizing weakened the fibers, resulting in a nominal 15% tensile strength reduction. Both batch and continuous processes of whiskerizing were developed, with on-stream resin impregnation also added to the continuous whiskerizing process. Whiskerized chopped fiber prepreg was investigated as a molding compound, but gave no consistent improvement over unwhiskered fiber for the same purpose. (Author)

AD-757 691 PC$3.00/MF$0.95
Fabric Research Labs Inc Dedham Mass
STRESS-STRAIN RESPONSE OF FABRICS UNDER TWO-DIMENSIONAL LOADING. PART II: LENTICULAR YARN CROSS-SECTION.
Technical rept.,
W. Denney Freeston, Jr., Meredith M. Schoppee, and Mary Ann Wall. Aug 71, 210p USA-NLABS-TR-73-25-GP
Contract DAAG17-70-C-0030
See also Part 1, AD-757 697.

Descriptors: (*Textiles, Strain (Mechanics)), (*Fibers, Stresses), Mathematical models, Loading (Mechanics), Elongation, Analysis, Elasticity, Tensile properties, Army equipment.
Identifiers: Lenticular yarn cross-section, Plain weave fabrics, Crimp interchange, Computer aided analysis, Yarn extension.

A theoretical analysis of the load-elongation behavior of idealized plain-weave fabrics comprised of yarns having a lenticular cross-section and subjected to biaxial stresses is presented. Fabric strains resulting from both crimp interchange and yarn extension are included. The analytical expressions derived have been solved with a digital computer for both inextensible and linearly elastic materials. Generalized plots of the results are presented for an initial fabric structure with equal crimp distribution in both sets of yarns. (Author)

AD-757 697 PC$3.00/MF$0.95
Fabric Research Labs Inc Dedham Mass
STRESS-STRAIN RESPONSE OF FABRICS UNDER TWO-DIMENSIONAL LOADING. PART I: RACETRACK YARN CROSS-SECTION.
Technical rept.,
W. Denney Freeston, Jr., Meredith M. Schoppee, and Mary Ann Wall. Mar 71, 191p* USA-NLABS-TR-73-24-GP
Contract DAAG17-70-C-0030
See also Part 2, AD-757 691.

Descriptors: (*Textiles, Strain (Mechanics)), (*Fibers, Stresses), Mathematical models, Loading (Mechanics), Elongation, Analysis, Elasticity, Tensile properties, Army equipment.
Identifiers: Plain weave fabrics, Crimp interchange, Yarn extension, Computer aided analysis, Racetrack yarn cross-section.

A theoretical analysis of the load-elongation behavior of idealized plain-weave fabrics comprised of yarns having a racetrack cross-section and subjected to biaxial stresses is presented. Fabric strains resulting from both crimp interchange and yarn extension are considered. The analytical expressions derived have been solved with a digital computer for both extensible and linearly elastic materials. Generalized plots of the results are presented for two extremes of initial fabric structure: (1) equal crimp distribution in both sets of yarns; (2) one set of yarns noncrimped -- straight. (Author)

11F. Metallurgy and Metallography

AD-757 015 PC$3.00/MF$0.95
Naval Air Development Center Warminster Pa Air Vehicle Technology Dept
DETERMINATION OF TRACE ELEMENTS IN NICKEL BASE GAS TURBINE PARTS BY ATOMIC ABSORPTION SPECTROPHOTOMETRY.
Phase rept.,
David P. Hornick. 9 Feb 73, 35p Rept no. NADC-73037-30

Descriptors: (*Nickel alloys, *Atomic spectroscopy), (*Turbine parts, Atomic spectroscopy), Gas turbines, Silver, Bismuth, Cadmium, Lead, Impurities.
Identifiers: Atomic absorption spectroscopy, *Spectrochemical analysis, Failure analysis, Nickel alloy 713C, Nickel alloy Inconel 100, Nickel alloy B-1900.

An investigation is described to ascertain whether or not atomic absorption spectrophotometry could be used to determine the concentration of trace elements such as silver (Ag), bismuth (Bi), cadmium (Cd), and lead (Pb) in nickel base alloys such as IN100, B1900 and 713C, without interference from the constituent elements. Failed and nonfailed gas turbine parts made of the above alloys were tested to ascertain whether trace amounts of these elements could have possibly caused the early failure of these gas turbine parts. (Author)

AD-757 042 PC$3.00/MF$0.95
Maryland Univ College Park Engineering Materials Group
A CONSTITUTIVE RELATION FOR DEFORMATION TWINNING IN BODY CENTERED CUBIC METALS.
Technical rept.,
Ronald W. Armstrong, and Peter J. Worthington.
Jan 73, 17p Rept nos. EMG-116, TR-9
Contract N00014-67-A-0239-0011

Descriptors: (*Twinning (Crystallography), Metals), (*Steel, Deformation), Cryogenics, Shear stresses, Strain (Mechanics), Grain structures (Metallurgy), Grain size, Nucleation, Phase studies, Microstructure, Fracture (Mechanics).
Identifiers: Body centered cubic lattices, *Brittle fracture, Steel 1010.

A constitutive relation is developed to describe the grain size, temperature and strain rate dependence of the stress required for the essentially elastic twinning of body centered cubic (bcc) metals at low temperatures. The relation is derived from a description of the bulk material strain produced by twinning and, also, from specifying on the basis of a thermal activation analysis the number of twins and the twinning nucleation rate. Two natural consequences of this development for bcc metals are that twins must be nucleated by pre-twinning slip and that twinning and brittle fracture are predicted to occur under very similar circumstances. These are normal experimental observations. (Author)

AD-757 206 PC$3.00/MF$0.95
Royal Aircraft Establishment Farnborough (England)
FRACTURE TOUGHNESS OF AL-ZN-MG-CU-MN ALLOYS TO DTD 5024.
Technical rept.,
C. J. Peel, and P. J. E. Forsyth. Nov 72, 49p Rept no. RAE-TR-72173 DRIC-BR-32731

Descriptors: (*Aluminum alloys, Fracture (Mechanics)), Zinc alloys, Magnesium alloys, Copper alloys, Iron alloys, Microstructure, Metallography, Tensile properties, Great Britain.

Five al-Zn-Mg-Cu alloy forgings were made with different compositions within the DTD 5024 specification limits to study the effect of composition variations on fracture toughness and tensile properties. (Author Modified Abstract)

AD-757 633 PC$3.00/MF$0.95
General Motors Technical Center Warren Mich Materials and Structures Lab
HIGH PRESSURE SHOCK WAVE BEHAVIOR OF GREATLY DISTENDED COPPER.
Contract rept.,
F. H. Shipman, and A. R. McMillan. Dec 72, 62p Rept no. MSL-71-30 BRL-CR-84
Contract DAAD05-71-C-0403

Descriptors: (*Copper, *Shock waves), (*Equations of state, Copper), Porous metals, Impact tests, Computer programs, High-pressure research.

High pressure shock waves were produced and studied in porous copper samples by high velocity impact of flat plates. Flat plates of copper and tungsten alloy were projected at velocities up to 8 mm/microsecs using a two-stage light gas gun. Samples of porous copper with distention ratios of 3.08, 4.46 and 8.74 (32.4%, 22.4% and 11.4% of solid density) were studied through shock transit measurements. Analysis of the experiments reveals that a complex (two-wave) shock structure exists in the open called materials impacted at conditions that would result in shock stresses up to 4 Mb in solid targets. The nature of the double wave precludes the use of the Rankine-Hugoniot equations which assume that thermo-dynamic equilibrium is attained behind a discontinuous shock. (Author)

AD-757 639 PC$3.00/MF$0.95
Defence Research Information Centre Orpington (England)
MUTUAL INFLUENCE OF STIMULATORS AND INHIBITORS ON THE CORROSION OF COPPER IN WATER,
S. A. Balezin. Feb 73, 6p Rept nos. DRIC-Trans-3075, DRIC-BR-30426
Trans. from Moskovskii Gosudarstvennyi Pedagogicheskii Institut. Uchenye Zapiski (USSR) p210-213 1969.

Descriptors: (*Copper, *Corrosion inhibition), Corrosion, Water, Reaction kinetics, N-heterocyclic compounds, Ethylenediamine, Amines, Ethanols, USSR.
Identifiers: Benzotriazoles, Ethanolamines, Translations.

The purpose of the paper was the examination of the protective action of benzotriazole (BTA) in relation to copper in water in presence of corrosion inhibitors for steel corrosion, namely ethylene diamine (EDA) and monoethanolamine (MEA), which are stimulators of the corrosion of copper.

AD-757 677 PC$3.00/MF$0.95
Massachusetts Inst of Tech Cambridge Center for Materials Science and Engineering
STRUCTURE AND PROPERTY CONTROL THROUGH RAPID QUENCHING OF LIQUID METALS.
Semi-annual technical rept. no. 5, 31 Jul-31 Dec 72,
Nicholas J. Grant, Regis M. Pelloux, Merton C. Flemings, and Ali S. Argon. 31 Dec 72, 128p*
Contract DAHC15-70-C-0283, ARPA Order-1608
See also report dated 31 Jul 72, AD-749 679.

Descriptors: (*Maraging steels, Powder metallurgy), (*Nickel alloys, Powder metallurgy), (*Cobalt alloys, Powder metallurgy), (*Powder metallurgy, *Quenching (Cooling)), Mechanical properties, Microstructure, Freezing, Atomization, Hot pressing, Processing, Hot working, Heat treatment.
Identifiers: Steel 18Ni, Nickel alloy IN-100, Cobalt alloy MAR-M-509.

The processing of billets from rapidly quenched liquid metals was investigated. Various powder metallurgy (P/M) and quench-casting techniques were employed to generate extremely fine dendrite arm spacings and homogeneous structures. Iron, nickel and cobalt-base alloy powders, produced by steam atomization (coarse powders), argon atomization, vacuum atomization, and the rotating electrode process, were consolidated into dense billets by hot isostatic pressing (HIP) and/or extrusion. The hot working properties of P/M billets and quench-cast bars were evaluated by hot rolling, high strain rate tests, and creep (superplastic) testing. Detailed analyses of microstructure, heat treatment, and mechanical properties are presented for all P/M alloys and compared to equivalent cast materials. (Author Modified Abstract)

AD-757 705 PC$3.00/MF$0.95
Lehigh Univ Bethlehem Pa Center for Surface and Coatings Research
MOSSBAUER SPECTROSCOPY STUDIES OF THE PASSIVATION AND CORROSION INHIBITION OF METALS.
Final rept. 16 Jan 70-5 Jan 73,
Henry Leidheiser, Jr., Gary W. Simmons, and Elsie Kellerman. 2 Feb 73, 8p AROD-8154:3-MC
Grants DA-ARO-D-31-124-72-G1, DA-ARO-D-31-124-70-G36

Descriptors: (*Corrosion, *Mossbauer effect), Corrosion inhibition, Films, Coatings, Oxidation, Iron, Non-destructive testing, Reaction kinetics, Polymers, Cobalt.
Identifiers: Passivity.

Major findings in four areas were summarized: (1) application of Mossbauer spectroscopy to the study of corrosion; (2) the osication of iron as studied by conversion-electron Mossbauer spectroscopy; (3) Mossbauer spectroscopic studies in situ of the passive film on cobalt; and (4) nondestructive monitoring by Mossbauer spectroscopy of the rate of corrosion of coated metal at the metal-polymer interface. (Author)

AD-757 706 PC$3.00/MF$0.95
Naval Civil Engineering Lab Port Hueneme Calif
THIN FILM PROTECTIVE POLYMERS FROM AMINES.
Technical note Jul 71-Jun 72,
Carl V. Brouillette. Jan 73, 9p Rept no. NCEL-TN-1259

Descriptors: (*Corrosion inhibition, *Plastic coatings), (*Steel, Plastic coatings), Films, Ultraviolet radiation, Polymerization, Amines, Complex compounds.
Identifiers: Thin films.

Amino compounds were applied to steel test specimens, by direct application and also from solution, and subjected to ultraviolet radiation to produce photo-oxidative polymerization on the surface of the steel. Thin film polymers were produced on the steel in many instances. The more adherent of these films appeared to resist wetting by tap water and were corrosion resisting. (Author)

ANL-TRANS-925 PC$3.00/MF$0.95
THERMODYNAMIC PROPERTIES AND DIAGRAM OF THE SYSTEM U-ND-O.
J. F. Wadier, J. P. Marcon, and O. Pesme. 7p
CONF-720843-14

Descriptors: *Neodymium alloys and systems, *Oxygen systems, *Uranium alloys and systems.

For abstract, see NSA 27 06, number 12390.

CEA-CONF-2128 PC$3.00/MF$0.95
Ecole Superieure De Chimie, Mulhouse (France).
MEASUREMENT OF CARBON AND OXYGEN IN SODIUM AND CESIUM THROUGH ACTIVATION BY MEANS OF GAMMA PHOTONS.
F. Nordmann, G. Tinelli, and C. Engelmann. 35p
CONF-721010-16
Lang- In French. From International Conference On Modern Trends In Activation Analysis-Saclay, France (2 Oct 1972). U. S. Sales only

Descriptors: *Carbon, *Cesium, *Oxygen, *Sodium.

For abstract, see NSA 27 06, number 11654.

CEA-CONF-2129 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Saclay (France). Centre D'Etudes Nucleaires.
SYSTEMATIC ANALYSIS OF TRACE ELEMENTS IN METALLIC GOLD BY NEUTRON ACTIVATION.
Serge May, Denis Piccot, and Guy Pinte. 10p
CONF-721010-15
Lang- In French. From International Conference On Modern Trends In Activation Analysis-Saclay, France (2 Oct 1972). U. S. Sales only

Descriptors: *Gold.

For abstract, see NSA 27 06, number 11655.

CEA-R-4361 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Bruyeres-Le-Chatel (France). Centre D'Etudes.
ROLE OF HYDROGEN IN THE STRESS CORROSION CRACKING OF AUSTENITIC STEELS IN CHLORIDE SOLUTIONS. ESTABLISHMENT

OF A POSSIBLE MECHANISM FOR THIS TYPE OF FISSURATION.
J. P. Fidelle, R. Broudeur, A. Pellissier-Tanon, and C. Roux. Oct 72, 40p
Lang- In French. U. S. Sales only

Descriptors: *Chlorides, *Hydrogen, *Steel.

For abstract, see NSA 27 06, number 12444.

COO-3084-14 PC$3.00/MF$0.95
Brown Univ., Providence, R. I. Div. Of Engineering.
ELASTIC-PLASTIC FRACTURE MECHANICS.
J. R. Rice. Aug 72, 8p CONF-720848-1
Contract AT (11-1)-3084
From 13. International Congress Of Theoretical And Applied Mechanics- Moscow, Ussr (aug 1972).

Descriptors: *Metals.

For abstract, see NSA 27 06, number 14373.

EURISOTOP-71 PC$3.00/MF$0.95
European Atomic Energy Community, Brussels (Belgium). Bureau Eurisotop.
CHEMICAL METHODS FOR DETERMINING OXYGEN IN NON-FERROUS METALS.
G. Kraft. Sep 72, 27p
U. S. Sales only

Descriptors: *Alkali metals, *Aluminum, *Aluminum alloys and systems, *Copper, *Copper alloys and systems, *Germanium, *Lead, *Lead alloys and systems, *Molybdenum, *Niobium, *Oxygen, *Selenium, *Silicon, *Tantalum, *Zirconium, *Zirconium alloys and systems.

For abstract, see NSA 27 06, number 11682.

IS-T-557 PC$3.00/MF$0.95
Ames Lab., Iowa.
SURFACE TENSION OF MOLTEN METALS USING THE SESSILE DROP METHOD.
D. R. Sageman. Nov 72, 107p
Contract W-7405-ENG-82
Thesis.

Descriptors: *Bismuth, *Indium, *Lead, *Tin.

For abstract, see NSA 27 06, number 14385.

JPRS-58137 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
INFLUENCE OF SEVERAL TECHNOLOGICAL PARAMETERS ON THE STRENGTH PROPERTIES OF THE EI893L ALLOY,
M. D. Nikitin, A. V. Malkevich, V. P. Prozorov, and V. K. Pustovoit. 2 Feb 73, 8p
Trans. of Energomashinostroenie (USSR) n6 p33-35 Jun 71.

Descriptors: (*Nickel alloys, Mechanical properties), Chromium containing alloys, Tungsten containing alloys, Molybdenum containing alloys, Titanium containing alloys, Aluminum containing alloys, Heat treatment, USSR, Translations, Gas turbine blades.

The report investigates several of the strength characteristics of the EI893L alloy during extraction and pouring in vacuum and in air as a function of the mode of heat treatment. (Author)

JPRS-58159 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
TIN AS AN ALLOYING ELEMENT IN HEAT-RESISTANT ALLOYS,
E. G. Nazarov, and S. B. Maslenkov. 6 Feb 73, 7p
Trans. of Metallovedenie i Termicheskaya Obrabotka Metallov (USSR) n3 p33-36 1972.

Descriptors: (*Heat resistant alloys, Tin containing alloys), (*Nickel alloys, Tin containing alloys), Chromium containing alloys, Titanium containing alloys, Microstructure, Mechanical properties, USSR, Translations.

The report contains results of tests on the effect of tin on the properties and structure of nickel-chrome alloy of the type KhN78T. (Author)

JPRS-58180 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
SELECTED TRANSLATIONS ON METALLURGY,
A. P. Gusenkov, S. V. Serensen, and R. M. Shneiderovich. 7 Feb 73, 40p
Trans. of Problemy Prochnosti v Mashinostroenii (USSR) n2 p21-27 1971, also includes trans. of monos. Soprotivlenie Deformirovaniyu i Razrusheniyu pri Malom Chisle Tsiklov Nagruzheniya, Moscov, 1967 p64-75, and Prochnost pri Malom Chisle Tsiklov Nagruzheniya, Moscow, 1969 p80-87.

Descriptors: (*Deformation, Metals), (*Fatigue (Materials), *Metals), Alloys, Failure, USSR, Translations.
Identifiers: Translations.

The report contains studies on properties of diagrams of cyclic deformation at increased temperatures, criteria of breakdown in cyclic elastic-plastic deformation and resistance to low-cycle deformation and fatigue in metals and alloys. (Author)

JPRS-58347 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
PHYSICAL CHARACTERISTICS OF MAGNESIOTHERMAL TITANIUM SPONGE WITH HARDNESS LESS THAN HB 100,
R. A. Sandler, E. A. Arutyunov, A. S. Kuzmenko, and V. I. Nazarova. 28 Feb 72, 10p
Trans. of Akademiya Nauk SSSR. Izvestiya. Metally, n1 p50-56 1973.

Descriptors: (*Titanium, Sponge metal), (*Pyrometallurgy, Titanium), Microstructure, Porosity, Magnesium, Titanium chlorides, USSR, Translations.

The report contains data on tests conducted on the production of high-quality spongy titanium with low residual chloride concentration after vacuum separation. (Author)

JPRS-58357 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
SELECTED TRANSLATIONS IN METALLURGY,
I. I. Papirov, I. N. Bogachev, and O. P. Maksimova. 1 Mar 73, 36p
Trans. of Fizika Metallov i Metallovedenie (USSR) v34 n5 p1022-1026, 1034-1041, 1075-1087 1972.

Descriptors: (*Beryllium, Electrical resistance), (*Austenitic steels, Metal rolling), (*Steels, *Work hardening), Mechanical properties, Deformation, Phase transformation, Chromium containing alloys, Manganese containing alloys, Translations, USSR.
Identifiers: Trip steels.

The report contains articles on the electrical resistance of hydroextruded and annealed beryllium, the effect of warm rolling on the mechanical properties of unstable chromium-manganese austenitic steel and on the development of martensitic conversion during deformation and the mechanical properties of trip steel. (Author)

LA-5055 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
PLUTONIUM-SCANDIUM SYSTEM.
F. H. Ellinger, K. A. Johnson, and C. C. Land. Nov 72, 6p
Contract W-7405-ENG-36

Descriptors: *Plutonium alloys and systems, *Scandium alloys and systems.

For abstract, see NSA 27 06, number 12474.

NIM-1484 PC$3.00/MF$0.95
National Inst. For Metallurgy, Johannesburg (South Africa).
COST ESTIMATES FOR THE PRODUCTION OF COPPER WIREBARS FROM SULPHIDIC ORES.
B. M. Wilson. 7 Nov 72, 22p
U. S. Sales only

Descriptors: *Copper.

For abstract, see NSA 27 06, number 14410.

N73-16558 PC$3.50/MF$0.95
Grumman Aerospace Corp., Bethpage, N.Y. Research Dept.
NORMAL EVAPORATION OF BINARY ALLOYS.
C. H. Li. Nov 72, 29p NASA-CR-124040, RM-558
Contract NAS8-27891

Descriptors: *Aluminum alloys, *Evaporation rate, *Nickel alloys, *Raoult law, Heat transfer, Numerical analysis, Thermodynamic properties.

For abstract, see STAR 11 07.

N73-16559 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EFFECT OF AUTOCLAVE HEAT TREATMENTS ON THE MECHANICAL PROPERTIES OF THE PREALLOYED POWDER COBALT--BASE ALLOY HS-31.
J. C. Freche, and R. L. Ashbrook. Feb 73, 24p
NASA-TN-D-7117, E-7107

Descriptors: *Autoclaving, *Cobalt alloys, *Heat treatment, *High temperature research, *Metal powder, Extruding, Mechanical properties, Metal working, Physical properties.

For abstract, see STAR 11 07.

N73-16561 PC$7.25/MF$0.95
Westinghouse Astronuclear Lab., Pittsburgh, Pa.
WELDABILITY, STRENGTH, AND HIGH TEMPERATURE STABILITY OF CHEMICALLY VAPOR DEPOSITED TUNGSTEN.
Final Report, 30 Jun. 1969 - 30 Apr. 1972
W. A. Bryant. Dec 72, 103p NASA-CR-120876, WANL-M-FR-72-007
Contract NAS3-13222

Descriptors: *High temperature research, *Materials tests, *Tungsten alloys, Electron beam welding, Physical properties, Thermodynamic properties.

For abstract, see STAR 11 07.

N73-16562 PC$5.50/MF$0.95
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
DEVELOPMENT OF ADVANCED HIGH STRENGTH TANTALUM BASE ALLOYS. PART 1 SCREENING INVESTIGATION.
Final Report, Oct. 1967 - 4 Jul. 1970
R. W. Buckman, Jr. Dec 71, 68p
NASA-CR-120818, WANL-PR-71-001-PT-1
Contract NAS3-10939

Descriptors: *High strength alloys, *Tantalum alloys, Solid solutions, Temperature effects, Tensile strength.

For abstract, see STAR 11 07.

N73-16563 PC$10.25/MF$0.95
General Electric Co., Cincinnati, Ohio. Aircraft Engine Group.
EXAMINATION OF THE INFLUENCE OF COATINGS ON THIN SUPERALLOY SECTIONS.
M. Kaufman. Aug 72, 165p NASA-CR-121115
Contract NAS3-15557

Descriptors: *Heat resistant alloys, *High temperature environments, *Protective coatings, Fatigue (materials), Oxidation resistance, Tensile strength.

For abstract, see STAR 11 07.

N73-16564 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
IMPROVEMENT IN CYCLIC OXIDATION OF THE NICKEL-BASE SUPERALLOY B-1900 BY ADDITION OF ONE PERCENT SILICON.
C. E. Lowell, and R. V. Miner. 18 Jan 73, 13p
NASA-TM-X-68191, E-7323

Descriptors: *Nickel alloys, *Oxidation, *Silicon, Heat resistant alloys, Metallography, X ray diffraction.

For abstract, see STAR 11 07.

ORNL-TM-3863 PC$3.00/MF$0.95
Oak Ridge National Lab., Tenn.
DESIGN AND OPERATION OF A FORCED-CIRCULATION CORROSION TEST FACILITY (MSR-FCL-1) EMPLOYING HASTELLOY N ALLOY AND SODIUM FLUOROBORATE SALT.
W. R. Huntley, and P. A. Gnadt. Jan 73, 66p
Contract W-7405-ENG-26

Descriptors: *Corrosion loops, *Hastelloy n, *Sodium fluorides, *Sodium fluoroborates.

For abstract, see NSA 27 06, number 12446.

ORNL-4839 PC$3.00/MF$0.95
Oak Ridge National Lab., Tenn.
MECHANICAL PROPERTIES AND STRUCTURE OF OXYGEN-DOPED TANTALUM-BASE ALLOY.
C. T. Liu, H. Inouye, and R. W. Carpenter. Dec 72, 38p
Contract W-7405-ENG-26

Descriptors: *Oxygen, *T- TANTALUM ALLOY.

For abstract, see NSA 27 06, number 12477.

RFP-TRANS-120 PC$3.00/MF$0.95
FIRST APPLICATION OF TEXTURE ANALYSIS TO METALLOGRAPHY.
J. J. Gautier, A. Hettler, and A. Haas. 22p

Descriptors: *Metallography, *Preferred orientation.

For abstract, see NSA 27 06, number 14419.

RFP-TRANS-123 PC$3.00/MF$0.95
EFFECTS OF THE ELASTIC DEFORMATION OF ZINC ON ACOUSTIC EMISSION.
V. P. Melekhin, R. I. Mints, and A. M. Kugler. 7p

Descriptors: *Zinc.

For abstract, see NSA 27 06, number 14420.

RFP-TRANS-126 PC$3.00/MF$0.95
TECHNIQUE FOR LEACHING USEFUL METALS FROM MINERALS OR ORES BY USE OF BACTERIA.
Ichiro. Ito. 22p

Descriptors: *Ores.

For abstract, see NSA 27 06, number 14422.

RISO-273 PC$3.00/MF$0.95
Danish Atomic Energy Commission, Risoe. Research Establishment.
ARTIFICIAL DEFECTS USED AT RISOE AS CALIBRATION STANDARDS FOR ULTRASONIC INSPECTION OF THIN-WALLED TUBING.
J. Domanus, and N. Nielsen. Sep 72, 24p
U. S. Sales only

Descriptors: *Ultrasonic testing, *Zircaloy.

For abstract, see NSA 27 06, number 11933.

TT-70-52020 PC$3.00/MF$0.95
National Bureau of Standards, Washington, D.C. Diffusion in Metals Data Center.
USE OF RADIOACTIVE ISOTOPES IN THE STUDY OF THE DIFFUSION PROCESSES, ACCOMPANIED BY PHASE AND CHEMICAL TRANSFORMATIONS (PRIMENENIE RADIOAKTIVNYKH IZOTOPOV DLYA IZUCHENIYA DIFFUZIONNYKH PROTSESSOV, SOPROVOZHDAYUSHCHIKHAYA FAZOVYMI I KHIMICHESKIMI PREVRASHCHENIYAMI),
A. D. Sotskov, Hao-I- Shan, and A. A. Zhukovitskii. 1970, 14p DMDC-2285
Trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Khimiya i Khimicheskaya Tekhnologiya (USSR) n3 p452-456 1960. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Diffusion, *Tracer studies), (*Alloys, Diffusion), Radioactive isotopes, Phase transformations, Silver alloys, Copper alloys, Iron alloys, Tin alloys, Zinc alloys, Lead alloys, Translations, USSR.

A radioactive tracer technique is described which is then employed to follow reactive diffusion processes in multiphase alloy systems. The displacement rates of phase boundaries in alloys of Cu-Ag, Fe-Cu, Ag-Sb, Cu-Sn, Sn-Pb, and Fe-Sn are reported. Solubility and tracer diffusion coefficients of silver and iron in copper were also measured in the temperature range 700 to 1050C. (Author)

TT-70-56085/2-3 PC$3.00/MF$0.95
Department of the Interior, Washington, D. C.
MINING AND METALLURGY QUARTERLY. NUMBER 2-3 1971,
Joze Duhovnik. 1973, 188p
Trans. of Rudarsko-Metalurski Zbornik (Yugoslavia) n2-3 p137-320 1971. The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D. C. Special Foreign Currency Science Information Program.

Descriptors: (*Mining engineering, Periodicals), (*Metallurgy, Periodicals), Mine hoisting, Coal mining, Belt conveyors, Grinding (Comminution), Minerals, Electrodynamics, Cadmium alloys, Indium alloys, Austenite, Iron ores, Oxygen, Permeability, Steels, Hot rolling, X ray spectroscopy, Bentonite, Yugoslavia, Translations.

Contents:
- Reconstruction of hoisting installation for increased production at the Velenj lignite mine;
- Mechanized driving of level gates and level roads in brown coal deposits;
- Some ideas for improving design calculations for continuous belt transporters;
- Structural parameters of solid phase, grindability and mechanism of grinding;
- Electrokinetic potential and surface properties of minerals;
- Determination of thermodynamic activities in system Cd-In by calorimetric measurements;
- Dilatometric determination of residual austenite;
- Electrochemical determination of the reducibility of iron ores;
- Potentiometric determination of oxygen permeability of some solid electrolytes at high temperatures;
- Improvement of the primary crystallization of steel;
- Variation of parameters influencing hot rolling of very thin steel strips;
- A comparison between x-ray and electron excitation in the x-ray spectrometry;
- Alkali activation of some Yugoslav bentonites.

Y-1861 PC$3.00/MF$0.95
Oak Ridge Y-12 Plant, Tenn. (Usa).
ANALYSIS OF STAINLESS STEELS BY X-RAY FLUORESCENCE SPECTROSCOPY.
R. J. Mcelhaney, and R. W. Morrow. 1 Dec 72, 15p
Contract W-7405-ENG-26

Descriptors: *Chromium, *Manganese, *Nickel, *Silicon, *Stainless steel, *Titanium.

For abstract, see NSA 27 06, number 11704.

11H. Oils, Lubricants, and Hydraulic Fluids

AD-757 061 PC$3.75/MF$0.95
Battelle Columbus Labs Ohio
THIN FILM RHEOLOGY OF BOUNDARY LUBRICATING SURFACE FILMS. PART 3.
Final rept. 1 Jan-5 Dec 72,
E. Drauglis, C. M. Allen, J. W. Droege, D. Ensminger, and R. J. Jakobsen. Dec 72, 45p*
Contract N00019-72-C-0204
See also Part 2, AD-734 151.

Descriptors: (*Lubricants, *Rheology), (*Nuclear magnetic resonance, Lubricants), Films, Boundary layer, Surface properties, Infrared spectroscopy, Theory, Molecular association, Shear stresses.
Identifiers: Thin films, Internal reflection infrared spectroscopy.

The principal objective of the program is to obtain a more fundamental understanding of the chemistry and physics of thin films of liquids in contact with solid substrates and the application of this understanding to the development of more systematic methods for the solution of boundary lubrication problems encountered in modern aeropropulsion technology. The report discusses the experimental techniques for the study of order in such films. Frustrated multiple internal reflection infrared spectroscopy (FMIR) and high resolution fourier transform nuclear magnetic resonance (NMR) were applied. In the first of these techniques, the film to be studied is formed on the surface of a prism, infrared radiation is sent into the prism, is multiply reflected and a spectrum is obtained that is characteristic of the liquid near the surface of the prism. Experiments performed on hexadecane films formed on germanium prism at various polarizations of the incident radiation showed conclusively that order must be present in hexadecane films. In addition, NMR experiments were performed on 1-octadecene films. In addition to the experimental work, an improved theory of the role of van der Waals forces in monolayer lubrication was developed. (Author Modified Abstract)

AD-757 471 PC$3.00/MF$0.95
Army Foreign Science and Technology Center Charlottesville Va

RHEOLOGICAL CHARACTERISTICS OF GREASES AND THE MAIN PRINCIPLES OF THEIR MOVEMENT IN TUBES (REOLOGICHESKIE KHARACTERISTIKI PLASTICHNYKH SMAZOK I OSNOVNYE ZAKONOMERNOSTI IKH DVIZHENIYA V KRUGLYKH TRUBAKH),
A. I. Nakorchevskii, G. B. Froishteter, and Yu. L. Ishchuk. 3 Nov 72, 14p Rept no. FSTC-HT-23-248-73
Trans. of Neftepererabotka i Neftekhimiya (USSR) n4 p81-89 1971.

Descriptors: (*Greases, *Rheology), Numerical analysis, Pipes, USSR.
Identifiers: Translations.

An approximation of the curves describing the flow of greases is proposed. Formulas were also derived for calculating the pseudoisothermal motion of greases in round tubes.

AD-757 605 PC$3.00/MF$0.95
Coating and Chemical Lab Aberdeen Proving Ground Md
DETERMINATION OF ZINC DIALKYL (DIARYL)DITHIOPHOSPHATE IN LUBRICATING OIL.
Final rept.,
Marjan Kolobielski. Feb 73, 43p* Rept no. CCL-320

Descriptors: (*Lubricant additives, Chemical analysis), Sulfur compounds, Phosphates, Internal combustion engines, Hydrolysis, Gas chromatography, Spectra (Infrared).
Identifiers: *Zinc phosphorodithioates, *Phosphorodithioates.

The overall objective of the project is the development of new and improved methods for determining composition of lubricating oils used in internal-combustion engines. This particular study is concerned with the development of analytical methods for identifying, separating, and determining the concentration of zinc dialkyl (diaryl) dithiophosphate additive present in fully formulated lubricating oils. Simple, rapid, qualitative tests for identification of the additive were developed. The additive was separated from the base hydrocarbon oil and isolated in a concentrated form by means of elution chromatography on silica gel-celite mixtures. The best results were obtained when the water content of the silica amounted to about 15-20 percent. The approximate concentration of the additive was determined by a combination of methods consisting of hydrolysis, elution and gas chromatography, as well as elemental analysis. (Author)

N73-16521 PC$3.50/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
INFLUENCE OF LIQUID LUBRICANT PROPERTIES ON THEIR PERFORMANCE.
V. Wedeven. 1972, 30p NASA-TM-X-68183, E-7151
Conf- Presented At the Lubrication Properties Seminar, New York, 12 Oct. 1972, Sponsored By the Am. Soc. of Lubrication Engr.

Descriptors: *Chemical composition, *Lubricants, *Molecular structure, *Performance, Electrohydrodynamics, Hydrodynamics, Physical properties, Pressure effects, Temperature effects.

For abstract, see STAR 11 07.

N73-16522 PC$3.00/MF$0.95
Northwestern Univ., Evanston, Ill.
EFFECT OF SURFACE ASPERITY ON ELASTOHYDRODYNAMIC LUBRICATION.
K. Lee, and H. S. Cheng. Feb 73, 76p
NASA-CR-2195
Contract NGL-14-007-084

Descriptors: *Elastohydrodynamics, *Lubrication, *Surface roughness effects, Equations, Film thickness, Pressure, Problem solving.

For abstract, see STAR 11 07.

N73-16578 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
THE EFFECT OF OXYGEN CONCENTRATION ON THE BOUNDARY LUBRICATING CHARACTERISTICS OF AN UNFORMULATED C-ETHER TO 300 C.
W. R. Jones, Jr. Feb 73, 17p NASA-TN-D-7155, E-6987

Descriptors: *Boundary lubrication, *Oxygen, *Polyphenyl ether, Friction measurement, Nitrogen, Sliding friction, Temperature gradients.

For abstract, see STAR 11 07.

11I. Plastics

AD-757 575 Reprint
Case Western Reserve Univ Cleveland Ohio
SMALL ANGLE X-RAY DIFFRACTION FROM CRYSTALLINE POLYMERS,
A. F. Burmester, and P. H. Geil. 1972, 59p AROD-9067:2-C
Contract DAHC04-70-C-0032
Availability: Pub. in Advances in Polymer Science and Engineering, New York, 1972 p42-100.

Descriptors: (*Plastics, *X-ray diffraction analysis), (*Polyethylene plastics, X-ray diffraction analysis), Phase studies, Nylon, Surface properties.
Identifiers: *Poly (oxy-methylene), Small angle X ray diffraction.

An investigation of the small angle diffraction (SAXD) patterns of various polyethylene (PE) and polyoxymethylene (POM) specimens suggests that the two discrete peaks generally produced by as-crystallized material are due to the presence of two separate diffracting structures. Electron microscopy (EM) observations of a POM fracture surface also revealed two distinct physical structures which corresponded to the two SAXD peaks obtained from that specimen. The lamellae appearing on the free surfaces of unoriented melt crystallized POM and PE correspond to the second or smaller SAXD long period. (Author Modified Abstract)

AD-757 720 PC$3.00/MF$0.95
Oak Ridge National Lab Tenn
THE DEVELOPMENT OF RADIATION-RESISTANT INSULATORS.
Final rept. 1 Jul 66-15 Jan 72,
W. W. Parkinson, and M. J. Kelly. Aug 70, 105p Rept no. ORNL-4842
Contract W-7405-eng-26 (16)
See also report dated Aug 70, AD-710 263.

Descriptors: (*Electric insulation, *Radiation damage), (*Styrene plastics, Radiation damage), (*Dosimeters, Radiation damage), Errors, Electrical conductance, Water, Colloids, Thiols, Dielectric properties, Sulfates.
Identifiers: Holes (Electron deficiencies), Emulsions.

The electrical properties of capacitor insulation (the critical component in ion-chamber, quartz-fiber dosimeters) were related to theories of conduction and dielectric relaxation in insulators. A general survey revealed that a K2S2O8-initiated, emulsion-polymerized copolymer of styrene and alpha-methyl styrene had a uniquely rapid decay of conductivity following irradiation. The decay of conductivity resulted from removal of mobile charge carriers (identified as electrons or 'holes') by a polar phase uniformly dispersed through the polymer by association with sulfate chain ends. A recipe for polymerization of a styrene homopolymer having such trapping species was optimized for moisture sensitivity and fabrication characteristics. It was found that acid groups (methacrylic, maleic) copolymerized with styrene were without effect on postirradiation conductivity. Effective trapping was produced, however, by neutralization and incorporation of water or emulsifier. This demonstrated that trapping action was not associated with a unique chemical composition but with a strongly polar phase uniformly distributed through the polymer. (Author Modified Abstract)

N73-16579 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
PREPARATION AND PROPERTIES OF POLYTETRAFLUOROETHYLENE IMPREGNATED WITH RHENIUM OXIDES.
H. F. Leibecki, and R. W. Easter. Feb 73, 20p NASA-TN-D-7166, E-7026

Descriptors: *Mechanical properties, *Polytetrafluoroethylene, *Rhenium compounds, Electrical resistivity, Impregnating, Molecular diffusion, Oxides, Thermal conductivity.

For abstract, see STAR 11 07.

11J. Rubbers

N73-16112 PC$3.75/MF$0.95
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
TRANSIENT PERMEATION OF ORGANIC VAPORS THROUGH ELASTOMERIC MEMBRANES.
J. E. Curry. 22 Jan 73, 31p NASA-TM-X-64721

Descriptors: *Permeating, *Rubber, *Time lag, Acetone, Benzene, Diffusion coefficient, Elastomers.

For abstract, see STAR 11 07.

12. MATHEMATICAL SCIENCES

12A. Mathematics and Statistics

AD-757 019 PC$3.00/MF$0.95
Florida State Univ Tallahassee Dept of Statistics
INCOMPLETE CONTINGENCY TABLES: CONDITIONS FOR THE EXISTENCE OF UNIQUE MAXIMUM LIKELIHOOD ESTIMATION (MLE).
Technical rept.,
I. Richard Savage. Dec 72, 17p Rept nos. FSU-Statistics-M246, TR-70-ONR
Contract N00014-67-A-0235-0006

Descriptors: (*Statistical analysis, Tables), Random variables, Inequalities, Theorems.
Identifiers: *Contingency tables, *Maximum likelihood estimation.

AD-757 021 PC$3.00/MF$0.95
Florida State Univ Tallahassee Dept of Statistics
A BAYESIAN GUIDE TO THE UNKNOWN.
Technical rept.,
I. Richard Savage. Jan 73, 16pp Rept nos. FSU-Statistics-M249, TR-72-ONR
Contract N00014-67-A-0235-0006

Descriptors: (*Statistical analysis, Reviews), Probability, Decision theory, Instruction manuals.
Identifiers: Bayesian estimation, Statistical inference, Applications of mathematics.

The paper is an extended book review in the Bayesian viewpoint of Statistics: A Guide to the Unknown (1972), which is a collection of 44 essays describing applications of statistics.

AD-757 022 PC$3.00/MF$0.95
Florida State Univ Tallahassee Dept of Statistics
A CHARACTERIZATION OF EXPONENTIAL FAMILY DISTRIBUTIONS BY EXPECTATION OF THE SUFFICIENT STATISTICS.
Technical rept.,
Allan R. Sampson. Feb 73, 16p Rept nos. FSu-Statistics-M251, TR-73-ONR
Contract N00014-67-A-0235-0006

Descriptors: (*Statistical distributions, Moments), Probability density functions, Random variables, Theorems.
Identifiers: Normal density functions, Wishart density functions, Poisson density functions, Bernoulli density functions, *Exponential density functions.

It is shown that if T bar has an unknown exponential family distribution with natural parameter (theta bar), then (G bar) = ET uniquely specifies the moment generating function of T bar. Conversely, it is proved that if T bar is a random variable with a moment generating function of a prescribed form, then it has an exponential family distribution. These results are used to characterize the Normal, Poisson, Bernoulli and Wishart distributions, among others. (Author)

AD-757 023 PC$3.00/MF$0.95
Florida State Univ Tallahassee Dept of Statistics
STOPPING TIMES OF TWO RANK ORDER PROBABILITY RATIO TESTS FOR SYMMETRY.
Technical rept.,
Harrison D. Weed, Jr., Ralph A. Bradley, and Z. Govindarajulu. Feb 73, 19p Rept nos. FSu-Statistics-M253, TR-74-ONR
Contracts Nonr-988 (08), N00014-67-A-0235-0006
Prepared in cooperation with Kentucky Univ., Lexington. Grant NSF-GP-7847.

Descriptors: (*Sequential analysis, *Statistical tests), Probability, Sampling, Distribution functions, Random variables, Theorems.
Identifiers: Probability ratio tests, *Rank order statistics, Stopping times (Mathematics).

Two models for modified, one-sample, sequential probability ratio tests for symmetry based on Lehmann alternatives are considered, one developed by Weed and Bradley and one by Govindarajulu. It is shown how they are related. Sure termination of the SPRT's is established under very general conditions. (Author Modified Abstract)

AD-757 024 PC$3.00/MF$0.95
Wisconsin Univ Madison Dept of Statistics
THE RELIABILITY OF INDEPENDENT EXPONENTIAL SERIES SYSTEMS - A BAYESIAN APPROACH.
Technical rept.,
Norman R. Draper, and Irwin Guttman. Dec 72, 38p Rept no. UWIS-DS-72-317
Contract N00014-67-A-0128-0017
Prepared in cooperation with Toronto Univ. (Ontario).

Descriptors: (*Statistical analysis, *Reliability), Sampling, Random variables, Confidence limits, Transformations (Mathematics), Distribution functions, Exponential functions, Life expectancy.
Identifiers: Bayesian estimation, Maximum likelihood estimation, Life tests.

Leiberman and Ross have recently given a solution to the problem of finding confidence intervals for the reliability function R (t) of two independent exponential series systems via a sampling theory approach. In the paper the authors examine the problem from the Bayesian point of view. The authors deal with both the uncensored and the censored cases, and illustrate the work with examples. (Author)

AD-757 025 PC$3.00/MF$0.95
Wisconsin Univ Madison Dept of Statistics
CHERNOFF EFFICIENCY OF LINEAR RANK STATISTICS.
Technical rept.,
Tea-Yuan Hwang. Dec 72, 76p Rept no. UWIS-DS-72-318
Contract N00014-67-A-0128-0017, Grant AF-AFOSR-1803-69
Sponsored in part by National Science Foundation, Grant NSF-GP-12093.

Descriptors: (*Statistical analysis, Theorems), Sampling, Probability, Statistical tests, Inequalities, Curve fitting, Graphics, Computer programs, Theses.
Identifiers: Chernoff efficiency, Asymptotic efficiency, Hypotheses, T test, Ranking.

A theorem of Hoadley used to compute large deviation probabilities for linear rank statistics with bounded score functions is extended to cover the unbounded case. The theorem is then applied to compute large deviation probabilities under alternatives in order to obtain the Chernoff efficiency of linear rank statistics. Numerical values are obtained under normal location alternatives for the two sample Wilcoxon and are shown to decrease more slowly than do corresponding Bahadur efficiency values with increasing location difference. (Author)

AD-757 026 PC$3.00/MF$0.95
Wisconsin Univ Madison Dept of Statistics
SIMON NEWCOMB, PERCY DANIELL, AND THE HISTORY OF ROBUST ESTIMATION, 1385-1920.
Technical rept.,
Stephen M. Stigler. Dec 72, 29p Rept no. UWIS-DS-72-319
Contract N00014-67-A-0128-0017
Prepared in cooperation with Chicago Univ., Ill. Dept. of Statistics, Grant NSF-GP-32037.

Descriptors: (*Statistical analysis, Reviews), Distribution functions, Sampling, History.
Identifiers: Statistical inference, *Robust procedures, Estimation theory, Order statistics.

The paper surveys the history of robust estimation from Laplace to Daniell, including the work of Newcomb, Edgeworth, Galton, and Sheppard. Particular attention is given to work which is relevant to modern lines of thought. (Author)

AD-757 028 PC$3.00/MF$0.95
Center for Naval Analyses Arlington Va Operations Evaluation Group
GAMBLER'S RUIN AND SEQUENTIAL ANALYSIS,
H. Weingarten. 7 Aug 64, 18p Rept no. OEG-Research Contrib-59
Contract Nonr-3732 (00)

Descriptors: (*Probability, Problem solving), (*Game theory, Sequential analysis), Difference equations, Matrix algebra.
Identifiers: Gamblers ruin, Random walk, Sequential probability ratio tests.

A straightforward algebraic approach successfully demonstrates that the solutions to the classical gambler's ruin (also known as random walk on a straight line), and a suitably stated version of the sequential analysis testing of a hypothesis, are identical. That is gambler's ruin and sequential analysis are essentially the same, from the point of view of the probability problem which is solved. (Author)

AD-757 068 PC$3.00/MF$0.95
North Carolina Univ Chapel Hill Dept of Statistics
RENEWAL THEORY IN TWO DIMENSIONS: BASIC RESULTS.
Jeffrey J. Hunter. Feb 73, 43p Rept no. Mimeo Ser-861
Contract N00014-67-A-0321-0002, Grant NSF-GU-2059

Descriptors: (*Stochastic processes, Distribution functions), Random variables, Exponential functions, Integral transforms, Theorems.
Identifiers: *Renewal theory, Renewal processes, Bivariate analysis, Laplace transformation, Generating functions, Exponential density functions.

In the paper a unified theory for studying renewal processes in two dimensions is developed. Bivariate probability generating functions and bivariate Laplace transforms are the basic tools used in generalizing the standard theory of univariate renewal processes. Two examples involving the use of independent and correlated exponential distributions are presented. These are used to illustrate the general theory and explicit expressions for the two dimensional renewal density, the two dimensional renewal function, the correlation between the marginal univariate renewal counting processes, and other related quantities are derived. (Author)

AD-757 094 PC$3.00/MF$0.95
Cornell Univ Ithaca N Y Dept of Operations Research
SEQUENTIAL ESTIMATION OF THE LARGEST NORMAL MEAN WHEN THE VARIANCE IS KNOWN.
Technical rept.,
Saul Blumenthal. Feb 73, 46p Rept no. TR-171
Contract N00014-67-A-0077-0020
Prepared in cooperation with New York Univ., N.Y. School of Engineering and Science, Grant NSF-GK-14073. See also report dated Jan 73, AD-757 106.

Descriptors: (*Sequential analysis, Distribution functions), Sampling, Random variables, Stochastic processes, Measure theory, Transformations (Mathematics), Theorems, Analysis of variance.
Identifiers: Normal density functions, Parameter estimation, *Sequential estimation, Stopping rules (Mathematics), Mean.

Given n observations from each of k normal populations with common known variance (sigma squared), the value of the largest of the k means (whose values are not known) is to be estimated using the largest value of the k sample means. It is desired to design a sampling rule which guarantees that the Mean Squared Error (M.S.E.) of the estimate does not exceed a given bound regardless of the configuration of values of the k means. (Author Modified Abstract)

AD-757 106 PC$3.00/MF$0.95
Cornell Univ Ithaca N Y Dept of Operations Research
SEQUENTIAL ESTIMATION OF THE LARGEST NORMAL MEAN WHEN THE VARIANCE IS UNKNOWN.
Technical rept.,
Saul Blumenthal. Jan 73, 22p Rept no. TR-164
Contract N00014-67-A-0077-0020
Prepared in cooperation with New York Univ., N.Y. School of Engineering and Science, Grant NSF-GK-14073. See also report dated Feb 73, AD-757 094.

Descriptors: (*Sequential analysis, Distribution functions), Sampling, Analysis of variance, Random variables, Theorems.
Identifiers: Parameter estimation, Normal density functions, Stopping rules (Mathematics).

Given n observations from each of k populations whose distributions differ by a location parameter, the value of the largest parameter is to be estimated using the largest value of the k sample means. It is desired to design a sampling rule which guarantees that the Mean Squared Error (M.S.E.) of the estimate does not exceed a given bound when the distributions have a common but unknown scale parameter. A sequential sampling scheme is devised based on an estimate of the

scale parameter and a least favorable configuration of the location parameters. The sample size characteristics of the sampling plan studied under mild restrictions on the distributions involved. The M.S.E. of the resulting estimator is studied under the additional assumption of normality. A brief discussion is given of an alternate sequential plan which uses information in the sample regarding the configuration of the location parameters. (Author)

AD-757 182 Not available NTIS
California Univ San Diego La Jolla Dept of the Aerospace and Mechanical Engineering Sciences
PROCEEDINGS OF THE SYMPOSIUM ON NONLINEAR ESTIMATION THEORY AND ITS APPLICATIONS (3RD.), HELD AT SAN DIEGO, CALIFORNIA, ON 11-13 SEP 72.
Final rept.,
Harold W. Sorenson, Allan D. Dayton, Richard E. Mortensen, Edwin B. Stear, and Allen R. Stubberud. 13 Sep 72, 325p AFOSR-TR-73-0465
Grant AF-AFOSR-2257-72
See also AD-742 843.
Availability: Paper copy available from Western Periodicals Co., 1300 Raymer St., North Hollywood, Calif 91605 $35.00.

Descriptors: (*Adaptive control systems, Mathematical models), Linear systems, Nonlinear systems, Inertial navigation, Radar tracking, Sonar signals, Identification systems, Partial differential equations, Information theory, Bionics, Artificial intelligence, Statistical analysis, Symposia.
Identifiers: *Nonlinear estimation, *Control theory, Signal processing, Kalman filters, Automatic control, Stochastic control.

The report presents the proceedings of the third Symposium on Nonlinear Estimation Theory and Its Applications such as in control theory, information theory, and biological signal processing. Various problems in radar tracking and sonar tracking are discussed.

AD-757 229 PC$3.00/MF$0.95
Bell Aerospace Co Buffalo N Y
ADAPTIVE PROCESSING FILTERING AND DESIGN OF DIGITAL SIGNALS FOR REAL-TIME ANALYSIS.
Final rept.,
Lester A. Gerhardt, and Kenneth W. Drake. Jan 73, 44p Rept no. 9500-920270 AFOSR-TR-73-0442
Contract F44620-72-C-0036

Descriptors: (*Adaptive control systems, Mathematical models), (*Information theory, Data transmission systems), Digital computers, Shift registers, Transfer functions, Integral transforms, Fourier analysis, Partial differential equations, Statistical analysis, Real time, Iterations, Algorithms.
Identifiers: Digital filters, Signal processing, *Control theory, *Data transmission, Fourier transformation, Adaptive filters, Computerized simulation.

The application of adaptive analog filters in the continuous case is investigated in order to derive algorithms for the control of the functional parameters (frequency, bandwidth) by adaption of the physical parameters (gains, multiplying factors). The available transforms from the continuous to the discrete domain are reviewed and the effects of the transforms on the filter parameters are considered in order to minimize the complexity of the resulting digital filters. For the discrete digital filters, the relationships of round-off, truncation and bit accuracy to the filter stability and convergence are investigated. The stability is also examined in relation to the network structure for arrangements of the delays and feedback connections other than the direct canonical form. A discrete processor based upon automata theoretic concepts is reviewed. The formal model is extended for application to noisy environments by use of its inherent flexibility in both the problem definition process and the solution realization phases. Realtime signal processing experiments are reported using the discrete processor for two recognition tasks with audio frequency signals. Several experimental techniques of statistical extension are discussed. (Author)

AD-757 233 PC$3.00/MF$0.95
California Univ Irvine School of Engineering
ON THE CHOICE OF A SYSTEM AND SENSOR CONFIGURATION FOR OPTIMAL LINEAR ESTIMATION.
Doctoral thesis,
Robert Grover Rains. 1972, 171p AFOSR-TR-73-0378
Grant AF-AFOSR-2116-71

Descriptors: (*Adaptive control systems, Mathematical models), Linear systems, Stochastic processes, Sensors, Matrix algebra, Differential equations, Guided missile launchers, Sensitivity, Optimization, Computer programs, White noise, Inertial navigation, Information theory, Entropy, Theses.
Identifiers: *Control theory, Automatic control, Time invariant systems, Time varying systems, Parameter estimation, *Stochastic control, Estimation theory, Kalman filters.

A system and sensor configuration control problem is formulated for a class of linear stochastic systems corrupted by Gaussian noise. The criterion function is a scalar measure of the terminal or steady-state error covariance matrix for the optimal linear estimator of the state of the system. A set of necessary conditions for optimality of a configuration control sequence is derived. The time-invariant case is examined in detail. A scalar example is solved analytically and a numerical algorithm is presented for the vector case. The time-varying problem with linear constraints is considered and two numerical methods of optimization are presented. (Author Modified Abstract)

AD-757 235 PC$3.00/MF$0.95
Michigan Univ Ann Arbor Dept of Mathematics
RESEARCH ACTIVITIES IN GRAPH THEORY.
Final rept.,
Frank Harary. Mar 73, 5p AFOSR-TR-73-0473
Grant AF-AFOSR-1515-68

Descriptors: (*Graphics, Theory), Numerical analysis, Scientific research.
Identifiers: *Graph theory, Applications of mathematics.

The report is a brief summary of the results obtained during a five year basic research effort in the theory of graphs and its application to Air Force systems design and analysis. It includes an identification of the twelve research topics which received major attention, an identification of the scientific and engineering problem areas in which theoretical results have been applied, and a listing of six books and twenty-two technical papers resulting from the grant which describe in detail the theory and methodology developed. (Author)

AD-757 240 PC$3.00/MF$0.95
Systems Control Inc Palo Alto Calif
PARALLEL ESTIMATION FOR NONLINEAR AIR FORCE PROBLEMS.
Final rept.,
Edison T. S. Tse, Robert E. Larson, and Stephen R. McReynolds. Feb 73, 101p Rept no. SCI-5980-F AFOSR-TR-73-0441
Contract F44620-72-C-0026

Descriptors: (*Adaptive control systems, Mathematical models), (*Data processing systems, Algorithms), Information theory, White Noise, Dynamic programming, Statistical analysis, Random variables, Stochastic processes, Trajectories, Radar tracking, Nonlinear systems, Numerical analysis.
Identifiers: *Parallel processors, Markov processes, Nonlinear filtering, Kalman filters, Quantization, *Control theory, Illiac 4 computers.

The report describes various algorithms for calculating the modal trajectory estimate, the conditional mean state estimate and the weighted least squares trajectory estimate. These algorithms are suitable for implementation in a large class of parallel computers. The report also identifies a number of theoretical and computational questions where future research should be performed. (Author)

AD-757 281 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
A THREE DIMENSIONAL SOLUTION OF THE TRANSIENT FIELD PROBLEM USING ISOPARAMETRIC FINITE ELEMENTS.
Master's thesis,
Girard Thomas Lew. Dec 72, 122p

Descriptors: (*Partial differential equations, Integration), (*Computer programs, Instruction manuals), Conduction (Heat transfer), Vibration, Transients, Cylindrical bodies, Theses.
Identifiers: Finite element analysis, FORTRAN 4 programming language, FORTRAN, FIELD computer program, Numerical integration.

An isoparametric finite element formulation solving a general form of the transient field equation is presented in this thesis. The formulation is developed for fields in three-dimensional Euclidean space. A FORTRAN IV computer program employing double precision arithmetic, compact storage techniques, and providing the option of several numerical integration methods and types of finite elements in presented. Data input may be in rectangular, cylindrical, or spherical coordinates and variations in time integration step size are permitted. Time dependent boundary conditions are not considered. Comparisons of theoretical and computer solutions for a variety of test problems demonstrate close agreement. Instructions for use of the program are included. (Author)

AD-757 349 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
LARGE-SCALE COMPUTER-AIDED STATISTICAL MATHEMATICS.
Technical rept.,
Peter A. W. Lewis. Nov 72, 20p Rept no. NPS-55LW72111A

Descriptors: (*Statistical analysis, *Programming (Computers)), Random variables, Distribution functions, Multivariate analysis, Interfaces.
Identifiers: Computer aided analysis, Multiprogramming, Computerized simulation, Jackknife method, Estimation theory.

Some thoughts on large-scale computer-aided statistical mathematics (primarily simulation) which were presented at the 6th Annual Conference on the Computer Science/Statistics Interface conference are presented. (Author Modified Abstract)

AD-757 350 PC$4.50/MF$0.95
Houston Univ Tex Dept of Mechanical Engineering
FUNCTIONAL ANALYSIS USING WALSH FUNCTIONS.
Technical rept.,
Paul A. Coppinger. Dec 72, 62p* Rept no. TR-33
Contract N00014-68-A-0402-0003

Descriptors: (*Functional analysis, Special functions (Mathematical)), Integral transforms, Fourier analysis, Harmonic analysis, Difference equations, Least squares method, Spectrum analyzers, Pattern recognition, Information theory, Phase-locked systems, Computer programs, Mathematical models.

Identifiers: *Walsh functions, Signal processing, *Orthogonal functions, Computerized simulation, Fourier transformation, Spectrum analysis.

Functional analysis usually implies representing a signal by a series of sine-cosine functions, but is actually included in the much broader problem of decomposition, that is, separating an arbitrary signal into preferred component signals. The most common approach to decomposition still uses a complete orthogonal set of functions, such as sine-cosine functions or Bessel functions, and an integral transform. In recent years, much attention has been given to a relatively unknown set of orthogonal functions, the Walsh Functions. A general discussion of orthogonal functions and series expansion, and some of the properties of Walsh Functions are presented followed by the necessary theory to determine the component coefficients of linearly composed signals. The theory employs an integral transformation using Walsh Functions and a matrix transformation yielding a least-square-fit approximation. (Author Modified Abstract)

AD-757 351 PC$3.00/MF$0.95
Cornell Univ Ithaca N Y Dept of Operations Research
A DECOMPOSITION PROPERTY OF PARTITIONS.
Technical rept.,
Robert J. Weber. Jan 73, 10p Rept no. TR-166
Contract N00014-67-A-0077-0014, Grant NSF-GK-29838
Sponsored in part by Grant NSF-GP-32314.

Descriptors: (*Number theory, Theorems), Inequalities.
Identifiers: Partitions (Mathematics), Decomposition method.

Let n* denote the least common multiple of 1,2,...,n. Then any additive partition of a multiple of n* into the integers 1,2,...,n can be grouped into partitions of n*. (Author)

AD-757 352 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
METHODS FOR ASSESSING VARIABILITY, WITH EMPHASIS ON SIMULATION DATA INTERPRETATION.
Technical rept.,
Donald P. Gaver. Nov 72, 37p Rept no. NPS-55GV72111A

Descriptors: (*Analysis of variance, *Confidence limits), Probability density functions, Sampling, Tables, Queueing theory.
Identifiers: Jackknife method, Standard deviation.

The report describes and illustrates the use of a grouping technique (the jackknife) for setting confidence limits in simulation situations. (Author)

AD-757 364 PC$3.00/MF$0.95
Stanford Univ Calif Dept of Computer Science
THE COMPUTING TIME OF THE EUCLIDEAN ALGORITHM.
George E. Collins. Jan 73, 20p Rept nos. STAN-CS-73-331, AIM-187
Contract SD-183, ARPA Order-457
Sponsored in part by Grant NSF-GJ-30125. Report on Stanford Artificial Intelligence Project.

Descriptors: (*Numerical analysis, Programming (Computers)), (*Number theory, Algorithms), Set theory, Theorems.
Identifiers: Euclidean algorithm, Greatest common divisor, Computation, Arithmetic.

The maximum, minimum and average computing times of the classical Euclidean algorithm for the greatest common divisor of two integers are derived, to within codominance, as functions of the lengths of the two inputs and the output. (Author)

AD-757 377 PC$3.00/MF$0.95
New Mexico Univ Albuquerque Dept of Mathematics and Statistics
INDEPENDENCE OF EVENTS IN THE PRESENCE OF AN ENVIRONMENTAL EVENT.
Technical rept.,
S. Bell, and W. J. Zimmer. Feb 73, 26p Rept no. TR-268
Contract N00014-68-A-0155-0003

Descriptors: (*Probability, Theorems), Statistical tests, Random variables, Distribution functions, Set theory, Measure theory, Reliability.

In the paper the authors attempt to provide the theoretical analysis that may be needed to aid intuition. The authors present some precise definitions of independence of two events which are known to be equivalent. Next presented are similar definitions of conditional independence which are not equivalent. The authors look in detail at seven different statements of independence relating two events with a third event and investigate the implications of the relationships among these statements. It is believed that the study of these relationships provides the necessary insight into the assumption of independence and the different kinds of independence involved. (Author Modified Abstract)

AD-757 381 PC$3.00/MF$0.95
Denver Research Inst Colo
A BRIEF INTRODUCTION TO RAY METHODS FOR DISPERSIVE HYPERBOLIC EQUATIONS,
Norman Bleistein. Mar 73, 20p
Contract N00014-67-A-0394-0005
Presented at the AMS-SIAM Summer Institute in Applied Math, Potsdam, N. Y., Jun 72.

Descriptors: (*Partial differential equations, Wave functions), Initial value problems, Asymptotic series, Nonlinear differential equations, Vector analysis, Waveguides, Transport properties, Integration.
Identifiers: *Hyperbolic differential equations, Ray tracing, Klein-Gordon equation.

The ray method for dispersive hyperbolic equations is described via a specific example, i.e., application to the Klein-Gordon equation. Reference is made to other situations such as systems of partial differential equations and wave-guide problems. A fairly extensive bibliography is included. (Author)

AD-757 430 PC$3.00/MF$0.95
Purdue Univ Lafayette Ind Dept of Statistics
A SUBSET SELECTION PROCEDURE FOR REGRESSION VARIABLES,
George P. McCabe, Jr., and James N. Arvesen. Feb 73, 17p Rept no. Mimeograph Ser-316
Contract N00014-67-A-0226-0001, Grant NSF-GJ-30269

Descriptors: (*Regression analysis, Sampling), Selection, Matrix algebra, Algorithms, Random variables, Programming (Computers).

Given a regression model with p independent variables, several methods are available for selecting a subset of size t < p which gives an adequate description of the dependent variable. By using the capabilities of the computer, one can now determine the subset corresponding to the largest sample multiple correlation coefficient or equivalently the smallest residual mean square. Due to sampling variation, however, there is no guarantee that this corresponds to the smallest value of the expected residual mean square. A procedure is presented to determine a collection of subsets, each of given size t, having the property that the probability of including the subset corresponding to the smallest value of the expected residual mean square is bounded below by some prespecified constant, 1 - alpha. An example using real data is examined to illustrate the technique. (Author)

AD-757 445 PC$3.00/MF$0.95
Wisconsin Univ Madison Mathematics Research Center
R-SEPARATING SETS.
Technical summary rept.,
R. E. Gomory, T. C. Hu, and J. M. Yohe. 15 Nov 72, 29p Rept no. MRC-TSR-939
Contract DA-31-124-ARO (D)-462

Descriptors: (*Topology, Set theory), Curve fitting, Graphics, Theorems.
Identifiers: Jordon curves.

Two points a and b in a set S are said to be r-connected if there is a finite sequence of points a = p (0), p (1),..., p (n) = b with p (i) belongs to S' and the distance rho (p (i), P (i+1)) plus or minus r, I = 0,..., n-1. In the paper the authors deal with palnar r-separating sets C whose removal from the plane (R sub 2) r-separates two points a and b in (R sub 2) - C. More precisely, the report discusses the structure of irreducible r-separating subset. (Author)

AD-757 446 PC$3.00/MF$0.95
Wisconsin Univ Madison Mathematics Research Center
PERTURBATIONS OF BEST APPROXIMATION PROBLEMS.
Technical summary rept.,
Philip M. Anselone, and Joel Davis. Feb 73, 17p Rept no. MRC-TSR-1291
Contract DA-31-124-ARO (D)-462

Descriptors: (*Approximation (Mathematics), Vector spaces), Convex sets, Mapping (Transformations), Perturbation theory, Theorems.
Identifiers: *Approximation theory.

The purpose of the paper is to unify a number of continuity, perturbation, and discretization properties of best approximations in normed linear spaces or in metric or semimetric spaces. It extends work of Aubin and, more specifically, of Daniel. (Author)

AD-757 447 PC$3.00/MF$0.95
Wisconsin Univ Madison Mathematics Research Center
CYCLIC AND DIAGONAL PRODUCTS ON A MATRIX.
Technical summary rept.,
Gernot M. Engle, and Hans Schneider. Feb 73, 53p Rept no. MRC-TSR-1292
Contract DA-31-124-ARO (D)-462

Descriptors: (*Matrix algebra, Permutations), Mapping (Transformations), Set theory, Theorems.
Identifiers: Cyclic products, Diagonal products.

The authors unify the theory of cyclic and diagonal products of elements of matrices. Some new results are obtained on diagonal similarity, diagonal equivalence, complete reducibility and total support. (Author)

AD-757 449 PC$3.00/MF$0.95
Wisconsin Univ Madison Mathematics Research Center
REGULAR EQUIMODULAR SETS OF MATRICES FOR GENERALIZED MATRIX FUNCTIONS.
Technical summary rept.,
Gernot M. Engel. Jan 73, 47p Rept no. MRC-TSR-1299
Contract DA-31-124-ARO (D)-462

Descriptors: (*Matrix algebra, Permutations), Determinants, Set theory, Functions, Theorems.
Identifiers: Cyclic products.

Using expansions of generalized matrix functions by means of cyclic products and principal majors, conditions for regularity of equimodular classes of matrices are found. (Author)

AD-757 450 PC$3.00/MF$0.95
Wisconsin Univ Madison Mathematics Research Center
FOUNDATIONS OF FLOATING POINT COMPUTER ARITHMETIC.
Technical summary rept.,
J. M Yohe. Jan 73, 28p Rept no. MRC-TSR-1302
Contract DA-31-124-ARO (D)-462

Descriptors: (*Numerical analysis, Programming (COmputers)), (*Programming (Computers), *Algebra), Mapping (Transformations), Real numbers, Set theory, Theorems.
Identifiers: *Floating point operation, *Arithmetic, Computation.

A formal structure, within which computer arithmetic operations may be defined, is described. Several floating point arithmetic schemes are defined within this context. The structure described in the paper includes, as a substructure, the significance spaces of Matula. (Author)

AD-757 451 PC$3.00/MF$0.95
Wisconsin Univ Madison Mathematics Research Center
UNIFORM SPLINE INTERPOLATION OPERATORS IN (L SUB 2).
Technical summary rept.,
Franklin Richards. Jan 73, 13p Rept no. MRC-TSR-1305
Contract DA-31-124-ARO (D)-462

Descriptors: (*Interpolation, Functions), Polynomials, Theorems.
Identifiers: Spline functions, *Spline interpolation.

AD-757 470 PC$3.00/MF$0.95
Army Foreign Science and Technology Center Charlottesville Va
THE ADVANTAGES OF NOMOGRAPHIC METHODS,
G. Khovanskii. 10 Jan 73, 6p Rept no. FSTC-HT-23-1497-72
Trans. of Ekonomicheskaya Gazeta (USSR) n50 p22 1969.

Descriptors: (*Nomographs, Graphics), Programming (Computers), USSR.
Identifiers: Translations, Applications of mathematics.

The utilization range of the computational graphs, or nomographs, is remarkably wide: From military affairs to climate studies; from technological standardization to medicine. This is particularly true in regard to economics, and especially concrete economics. In a large number of economic problems, the parameters have to be arranged in such a manner that a maximum effect would be achieved. In addition, the dependences between these parameters are quite frequently nonlinear and cannot be programmed mathematically. This is when nomographs are of great help. (Author)

AD-757 478 PC$3.00/MF$0.95
Wisconsin Univ Madison Dept of Statistics
TOPICS IN CONTROL. 2. CONSTRAINED FEEDBACK CONTROL OF LINEAR DYNAMIC--STOCHASTIC SYSTEMS.
Technical rept.,
John F. MacGregor. Jul 72, 36p Rept no. UWIS-DS-72-307 AFOSR-TR-73-0507
Grant AF-AFOSR-2363-72
See also Chapter 1, AD-757 573 and Chapter 3, AD-757 502.

Descriptors: (*Adaptive control systems, Mathematical models), Linear systems, Transfer functions, Dynamic programming, Stochastic processes, Feedback, Optimization.
Identifiers: *Control theory, Feedback control, Stochastic control, Kalman filters, Automatic control.

The design of feedback controllers which minimize some quadratic function of the outputs and inputs (usually minimum mean square error at the output subject to constraints on the variances of the inputs) is treated from two points of view: Using discrete transfer function and ARIMA models to characterize the system and designing the optimal controllers by solving a discrete version of the Wiener-Hopf equation; Using state variable models to characterize the system and solving the optimal control problem by employing dynamic programming and Kalman filtering. The two methods are shown to be equivalent and which is to be used is solely a matter of convenience. The relative merits of each is discussed and examples are given. Using the first approach a general form for constrained controllers is worked out. For the second approach the dynamic programming solution to the optimal control problem is given and a simplified solution is developed for the univariate unconstrained control case. Expressions for the covaraince matrices of the output and input under feedback control are derived. Different ways of dealing with time delays in the process dynamics are discussed. (Author Modified Abstract)

AD-757 479 PC$3.00/MF$0.95
Wisconsin Univ Madison Dept of Statistics
D-OPTIMAL DESIGNS FOR DYNAMIC MODELS. PART II. APPLICATIONS.
Technical rept.,
Bernard Viort. Nov 72, 43p Rept no. UWIS-DS-72-316
Grant AF-AFOSR-2363-72

Descriptors: (*Experimental design, Statistical analysis), Mathematical models, Analysis of variance, Matrix algebra, Optimization, Computer programs.

In a preceding report (D-Optimal Designs For Dynamic Models, Part 1) some results on the theory of C-constrained D-optimal designs were presented. The present report is intended to be an illustration of the methods proposed: the consideration of different examples raises some interesting questions and remarks concerning both the theoretical situation considered in the previous report and the possible applications. The numerical methods developed in relation with the notion of D-optimality allow for a greater flexibility in judging the overall quality of a design, suggesting the need for a more general theory. (Author Modified Abstract)

AD-757 502 PC$3.00/MF$0.95
Wisconsin Univ Madison Dept of Statistics
TOPICS IN CONTROL. 3. FEEDFORWARD CONTROL.
Technical rept.,
John F. MacGregor, and George E. P. Box. Jul 72, 18p Rept no. UWIS-DS-308 AFOSR-TR-73-0477
Grant AF-AFOSR-2363-72
See also Chapter 2, AD-757 478.

Descriptors: (*Adaptive control systems, Mathematical models), Linear systems, Transfer functions, Time series analysis, Stochastic processes.
Identifiers: Feedforward control, *Control theory.

A general development is given for the feedforward control scheme which minimizes the mean square error of the output deviation from target using a general linear transfer function model to characterize the process dynamics and a general autoregressive-integrated-moving-average model to characterize the disturbance. It is then shown by way of an example how the state variable models and the optimal control theory of papers one and two in this series can be used to design feedforward controllers which minimize the mean square error of the output deviations from target subject to constraints on the variances of the manipulated variables. (Author Modified Abstract)

AD-757 511 PC$3.00/MF$0.95
Wisconsin Univ Madison Dept of Statistics
TOPICS IN CONTROL. 4. THE ANALYSIS OF CLOSED-LOOP DYNAMIC-STOCHASTIC SYSTEMS.
Technical rept.,
George E. P. Box, and John F. MacGregor. Jul 72, 33p Rept no. UWIS-DS-72-309 AFOSR-TR-73-0508
Grant AF-AFOSR-2363-72
See also AD-757 502.

Descriptors: (*Adaptive control systems, Mathematical models), Stochastic processes, Transfer functions, Identification systems, Feedback, White Noise, Statistical analysis.
Identifiers: *Control theory, Automatic control, *Stochastic control, Parameter estimation, Feedback control, Autocorrelation.

Some of the problems involved in the identification, estimation, and diagnostic checking of univariate closed-loop systems are discussed. The procedure used in open-loop operation for identifying the process transfer function by cross-correlating the input and output sequences is shown to be invalid in closed-loop situations because the input and disturbance sequences are correlated. Under pure feedback where the input is calculated completely from the output this cross-correlation procedure is shown to identify not the process transfer function but rather the inverse of the controller transfer function. However, if the controller is known and if one adds an independent noise sequence to the input, then the process transfer function can be identified by cross-correlating this added noise with the output. Once given a particular model its parameters can be estimated from closed-loop data. (Author Modified Abstract)

AD-757 512 PC$3.00/MF$0.95
Wisconsin Univ Madison Dept of Statistics
ON THE DISPERSION MATRIX OF THE MAXIMUM LIKELIHOOD ESTIMATORS OF THE PARAMETERS OF A DYNAMIC MODEL.
Technical rept.,
Bernard Viort. Oct 72, 31p Rept no. UWIS-DS-72-313 AFOSR-TR-73-0509
Grant AF-AFOSR-2363-72

Descriptors: (*Statistical analysis, Matrix algebra), Stochastic processes, Polynomials, Correlation techniques, Iterative methods.
Identifiers: Maximum likelihood estimation, Parameter estimation, Toeplitz matrices, Stationary processes.

The approximation of a Toeplitz matrix by a circulant matrix is used to derive the dispersion matrix of the parameters of a dynamic model when the error process is known and when one has an approximation of the value of the parameters. (Author)

AD-757 549 PC$3.00/MF$0.95
Wisconsin Univ Madison Dept of Statistics
OPTIMAL CONVERGENCE PROPERTIES OF THE POLYNOMIAL ALGORITHM FOR DENSITY ESTIMATION.
Tehnical rept.,
Grance Wahba. Nov 72, 10p Rept no. UWIS-DS-72-315 AFOSR-TR-73-0488
Grant AF-AFOSR-2363-72

Descriptors: (*Statistical analysis, Mathematical prediction), Sampling, Polynomials, Distribution functions, Interpolation, Convergence, Algorithms, Optimization, Theorems.
Identifiers: Order statistics.

AD-757 573 PC$3.00/MF$0.95
Wisconsin Univ Madison Dept of Statistics
TOPICS IN CONTROL. 1. STATE VARIABLE APPROACH TO TIME SERIES REPRESENTATION AND FORECASTING.
Technical rept.,

John F. MacGregor. Jul 72, 43p Rept no. UWIS-DS-72.306 AFOSR-TR-73-0506
Grant AF-AFOSR-2363-72
See also Chapter 2, AD-757 478.

Descriptors: (*Adaptive control systems, Mathematical models), Linear systems, Stochastic processes, Time series analysis, Transfer functions, White noise, Correlation techniques.
Identifiers: *Control theory, Stochastic control, Parameter estimation, Automatic control, Kalman filters.

The state variable approach to modelling discrete linear dynamic-stochastic systems is discussed and related to that using transfer function and autoregressive-integrated-moving-average (ARIMA) models. It is shown that the standard form of the state variable model using two independent Gaussian noise vectors which is used extensively in the literature is not a parsimonious representation (i.e., one that is efficient in its use of parameters) but that it can always be written in a more parsimonious form employing a single Gaussian noise vector. Several such parsimonious state representations are given for the general transfer function-ARIMA model. The Kalman filter for estimating the state vector is derived using a Bayesian argument and its use in time series forecasting and its relationship to recursive least squares are discussed. (Author Modified Abstract)

AD-757 580 Reprint
Rocketdyne Canoga Park Calif
TABLES FOR OBTAINING WEIBULL CONFIDENCE BOUNDS AND TOLERANCE BOUNDS BASED ON BEST LINEAR INVARIANT ESTIMATES OF PARAMETERS OF THE EXTREME-VALUE DISTRIBUTION,
Nancy R. Mann, and Kenneth W. Fertig. Oct 71, 15p ARL-73-0063
Contract F33615-70-C-1216
Revision of report dated May 71.
Availability: Pub. in Technometrics, v15 n1 p87-101 Feb 73.

Descriptors: (*Statistical distributions, Tables), Confidence limits, Sampling.
Identifiers: Percentiles, *Weibull density functions, Parameter estimation.

Tables are given for obtaining confidence bounds for the two parameters and the 90th, 95th, and 99th percentiles of the two-parameter Weibull or extreme-value distributions. The tables are based on best linear invariant estimators of extreme-value location and scale parameters and apply to samples of size n, n = 3 (1)16, which may be censored at the mth smallest sample observation, m = 3 (1)n. Discussion is given concerning other methods of obtaining confidence and tolerance bounds for these distributions, properties of the estimators on which the bounds are based and computational procedures used. (Author)

AD-757 581 Reprint
Aerospace Research Labs Wright-Patterson AFB Ohio
SOME OPTIMIZATION PROBLEMS IN PARAMETER ESTIMATION,
H. Leon Harter. 1971, 31p Rept no. ARL-73-0068
Availability: Pub. in Optimizing Methods in Statistics, p33-62 1971.

Descriptors: (*Statistical analysis, Optimization), Population (Mathematics), Sampling, Probability density functions, Monte Carlo method, Iterative methods, Mathematical prediction.
Identifiers: Maximum likelihood estimation, Parameter estimation, Order statistics, Newton-Raphson method, Quantiles.

Various optimization problems arise in connection with the estimation of parameters of statistical populations. Without making any attempt to present an exhaustive treatment, the author offers some observations concerning three such problems with which he has had experience. These problems are: Iterative procedures for maximum likelihood estimation, based on complete or censored samples, of the parameters of various populations; Optimum spacings of quantiles for linear estimation; and Optimum choice of order statistics for linear estimation. (Author Modified Abstract)

AD-757 609 PC$3.00/MF$0.95
Army Missile Command Redstone Arsenal Ala Aeroballistics Directorate
UTILIZATION OF Z-TRANSFORMS FOR DIGITAL PROGRAMMING.
Technical rept.,
Mickie P. Stamps. Dec 72, 14p Rept no. RD-72-22

Descriptors: (*Integral transforms, *Programming (Computers)), Difference equations, Transfer functions, Complex variables, Subroutines.
Identifiers: FORTRAN, FORTRAN 4 programming language, *Laplace transformation.

The report describes the use of two particular Z-transforms in digital solution of problems. Subroutines in FORTRAN 4 are presented for solving each of these transforms, and instructions are given for the reader's use. (Author)

AD-757 673 PC$3.00/MF$0.95
Naval Ship Engineering Center Philadelphia Pa Philadelphia Div
DIGITAL SIMULATION OF DYNAMICAL SYSTEMS.
Final rept.,
A. M. Loeb. 6 May 73, 21p Rept no. NAVSECPHILADIV-C-69-I

Descriptors: (*Partial differential equations, *Programming (Computers)), Systems engineering, Linear systems, Mathematical models, Matrix algebra, Numerical analysis, Integration.
Identifiers: Digital simulation, Finite difference theory, Computer aided design, Distributed parameter systems, Eigenvalues, Numerical integration.

The report covers the initial phases of an investigation into proved methods of simulating dynamical systems on a digital computer. The two main areas discussed are: Implicit temporal integration algorithms. It is shown why implicit temporal algorithms reduce computer time for stiff systems (systems with widely separated eigenvalues). Successful results using such algorithms are reported; Improved finite difference algorithms for the spatial derivatives in partial differential equations. Improved accuracy for finite difference methods coupling higher numbers of spatial points is demonstrated by an eigenvalue analysis of several linear distributed parameter systems. (Author)

AD-757 678 PC$3.00/MF$0.95
Carnegie-Mellon Univ Pittsburgh Pa Dept of Computer Science
THE COMPUTATIONAL COMPLEXITY OF ALGEBRAIC NUMBERS,
H. T. Kung. Mar 73, 9p
Contract N00014-67-A-0314-0010, Grant NSF-GJ-32111
Presented at the Annual ACM Symposium on Theory of Computing (5th), May 73.

Descriptors: (*Number theory, *Approximation (Mathematics)), Rational numbers, Complex numbers, Sequences, Convergence, Theorms.
Identifiers: Computational complexity, Algebraic number theory.

The effort required to approximate an algebraic number should increase with its degree. In this paper the assertion is proven in a precise sense. The author shows that the optimal efficiency of approximation can be achieved only for algebraic numbers which have very low degrees; in fact, degree one or degree two.

AD-757 679 PC$3.00/MF$0.95
Carnegie-Mellon Univ Pittsburgh Pa Dept of Computer Science
OPTIMAL ORDER OF ONE-POINT AND MULTIPOINT ITERATION,
H. T. Kung, and J. F. Traub. Feb 73, 30p
Contract N00014-67-A-0314-0010, Grant NSF-GJ-32111

Descriptors: (*Iterations, Functions), Algorithms, Set theory, Polynomials, Analytic functions, Theorems, Optimization.
Identifiers: Newton-Raphson method.

The problem is to calculate a simple zero of a nonlinear function f by iteration. The authors exhibit a family of iterations of order 2 sup (n-1) which use n evaluations of f and no derivative evaluations, as well as a second family of iterations of order 2 sup (n-1) based on n-1 evaluations of f and one of f'. In particular, with four evaluations, the authors construct an iteration of eighth order. The best previous result for four evaluations was fifth order. It is proven that the optimal order of one general class of multipoint iterations is (2 sup n) and that an upper bound on the order of a multipoint iteration based on n evaluations of f (no derivatives) is (2 sup n). (Author)

AD-757 685 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
OPTIMAL CONTROL OF SYSTEMS GOVERNED BY DELAYED-DIFFERENTIAL EQUATIONS.
Master's thesis,
Joseph Goree Hyde. Dec 72, 56p

Descriptors: (*Adaptive control systems, Mathematical models), Time-lag theory, Differential equations, Matrix algebra, Algorithms, Optimization, Theses, Feedback.
Identifiers: *Control theory, Automatic control, Feedback control, Delayed differential equations, Riccati equation, Regulators.

Optimal control of systems governed by delayed-differentail equations is explored by using the control theory developed for systems governed by ordinary differential equations. A simple algorithm for producing a suboptimal control law with restricted feedback is presented. Two examples illustrate the computational method. (Author)

COO-1469-212 PC$3.00/MF$0.95
Illinois Univ., Urbana. Dept. Of Computer Science.
AUTOMATIC SOLUTIONS OF PARTIAL DIFFERENTIAL EQUATIONS.
L. A. Larsen. Oct 72, 129p UIUCDCS-R-72-546
Contract AT (11-1)-1469
Thesis.

Descriptors: *Differential equations.

For abstract, see NSA 27 06, number 14366.

EUR-4908 PC$3.00/MF$0.95
European Atomic Energy Community, Ispra (Italy). Joint Nuclear Research Center.
ITERATIVE ARRAYS FOR CODE CONVERSIONS.
M. Combet. Nov 72, 21p
U. S. Sales only

Descriptors: *Mathematics.

For abstract, see NSA 27 06, number 14380.

JUL-861-MA PC$3.00/MF$0.95
Kernforschungsanlage, Juelich (West Germany). Zentralinstitut Fuer Angewandte Mathematik.
NUMERICAL SOLUTION OF SYSTEMS OF HYPERBOLIC INITIAL VALUE PROBLEMS IN MANY ARBITRARY CHANGES WITH THE HELP OF DIFFERENTIAL EQUATIONS.
H. W. Meuer. Jun 72, 119p
Lang- In German. Thesis. U. S. Sales only

Descriptors: *Mathematics.

For abstract, see NSA 27 06, number 14391.

KFK-1530 PC$3.00/MF$0.95
Kernforschungszentrum, Karlsruhe (West Germany). Institut Fuer Datenverarbeitung In Der Technik.
CONTROL FOR A REAL TIME SYSTEM WITH A SIMPLE HARDWARE STRUCTURE.
H. Herbstreith, and G. Hepke. Aug 72, 19p
Lang- In German. U. S. Sales only

Descriptors: *Control systems.

For abstract, see NSA 27 06, number 14395.

LA-DC-72-1441 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
EXPERIENCES IN LEAST SQUARES OPTIMIZATION IN THE LASL ENVIRONMENT.
M. M. Klein. 23p CONF-720727-1
Contract W-7405-ENG-36
From Regional Seminar On The Numerical Solution Of Nonlinear Algebraic Systems- Pittsburgh, Pa. (jul 1972).

Descriptors: *Mathematics, *Spectrometers.

For abstract, see NSA 27 06, number 12125.

RT/FIMA- (72)3 PC$3.00/MF$0.95
Comitato Nazionale Per L'Energia Nucleare, Rome (Italy).
RITZ METHOD APPLIED TO FOURTH ORDER DIFFERENTIAL EQUATIONS.
G. Buffoni, and G. Conforto. 9 May 72, 39p
Lang- In Italian. U. S. Sales only

Descriptors: *Differential equations.

For abstract, see NSA 27 06, number 14424.

SU-326-P-30-20 PC$3.00/MF$0.95
Stanford Univ., Calif. Dept. Of Computer Science.
RICHARDSON'S NONSTATIONARY MATRIX ITERATIVE PROCEDURE.
R. S. Andersen, and G. H. Golub. Aug 72, 76p
STAN-CS-72-304
Contract AT (04-3)-326

Descriptors: *Mathematics.

For abstract, see NSA 27 06, number 14439.

12B. Operations Research

AD-757 031 PC$3.00/MF$0.95
Center for Naval Analyses Arlington Va Operations Evaluation Group
TWO GAMES ARISING IN THE OPTIMAL ALLOCATION OF RESOURCES.
Interim research memo.,
Joseph Bram. 1 May 62, 18p Rept no. OEG-IRM-13

Descriptors: (*Game theory, Optimization), (*Antimissile defense systems, Mathematical models), Vulnerability, Probability density functions, Military strategy, Inequalities, Theorems.
Identifiers: Resource allocation.

AD-757 058 PC$3.00/MF$0.95
Control Analysis Corp Palo Alto Calif
MULTI-ITEM PLANNED PROCUREMENT AND SPOT BUY PROCEDURES.
Technical rept.,
Zachary F. Lansdowne, and Richard C. Morey. 23 Feb 73, 37p Rept no. TR-266-8
Contract N00014-72-C-0266

Descriptors: (*Inventory control, Mathematical models), (*Procurement, Optimization), Budgets, Decision theory, Distribution functions, Convex sets, Algorithms.
Identifiers: Constraints, Purchasing, Shortages, Spot buys.

A budget is available for purchasing certain items over a finite time horizon. A portion of this budget is spent on initial procurements, and then the remainder of the budget is set aside for so called spot buys. A spot buy occurs whenever the initial procurement for each item is exhausted and there is unmet demand. As spot buy purchases are usually accompanied by higher unit costs, there is an incentive to minimize there purchases by having sufficient initial procurements. On the other hand, if large initial procurements on all items are made, there may occur an imbalance situation at the end of the horizon in which there is excess stock in some items, shortages in other items, and no funds remaining in the budget. The report develops procedures for optimally determining the trade-off between initial purchases and spot buys. (Author)

AD-757 117 PC$3.00/MF$0.95
Decisions and Designs Inc Mclean Va
FIRST QUARTERLY TECHNICAL REPORT, QUARTER ENDED 31 JANUARY 1973.
Report for 1 Oct 72-31 Jan 73,
Clinton W. Kelly, III, and Cameron R. Peterson. Mar 73, 52p Rept no. 8-1
Contract N00014-73-C-0149, ARPA Order-2271
Report on Decision Theory Research.

Descriptors: (*Decision theory, Scientific research), Management planning, Problem solving, Military intelligence, Probability, Handbooks, Department of Defense, Decision making.
Identifiers: Resource allocation, Risk, *Policy making.

The report presents three tasks involved in decision theory research: Task 1 - Investigate procedures for improving human judgments of probabilities + utilities for decision making. In performing this investigation, DDI will conduct research on the application of decision theory to problems in policy analysis + resource allocation; Task 2 - Conduct problem oriented workshops for DOD personnel in which the potential value of decision analysis techniques is displayed to decision makers by showing them how decision analysis can be applied to real problems; Task 3 - Prepare a handbook for users of decision analysis designed for the manager, or staff, responsible for organizing and managing a decision analysis rather than for the decision analytic technician. (Author Modified Abstract)

AD-757 165 PC$3.00/MF$0.95
Florida Univ Gainesville Dept of Industrial and Systems Engineering
FINDING THE N MOST VITAL LINKS IN FLOW NETWORKS.
Research rept.,
H. D. Ratliff, G. T. Sicilia, and S. H. Lubore. Jan 73, 24p Rept no. RR-73-1 AROD-T-1.96-RT
Contract DAHC04-68-C-0002

Descriptors: (*Graphics, Flow charting), Algorithms, Networks, Set theory, Mathematical models.
Identifiers: *Network flows, Graph theory.

The n most vital links of a flow network are defined as those n arcs whose simultaneous removal from the network causes the greatest decrease in the throughput capability of the remaining system between a specified pair of nodes. These n arcs are shown to be the n largest capacity arcs in some cut. A solution procedure is developed which involves sequentially modifying the network in such a manner as to make this cut minimal. An algorithm with computational results is presented. (Author)

AD-757 354 PC$3.00/MF$0.95
Cornell Univ Ithaca N Y Dept of Operations Research
SYMMETRIC SIMPLE GAMES.
Technical rept.,
Robert James Weber. Feb 73, 9p Rept no. TR-173
Contract N00014-67-A-0077-0014, Grant NSF-GK-29838
Sponsored in part by Grant NSF-GP-32314.

Descriptors: (*Game theory, Theorems), Set theory, Bargaining, Mathematical models.
Identifiers: N person games.

A symmetric simple game is an n-person in which the winning coalitions are the coalitions of at least k players. All von Neumann-Morgenstern stable sets, in which (n-k) players are discriminated, are characterized for these games. (Author)

AD-757 357 PC$3.00/MF$0.95
Florida Univ Gainesville Dept of Industrial and Systems Engineering
A SHOP MODEL FOR A NAVAL AIR REWORK FACILITY.
Research rept.,
Christopher B. Haas, and Thom J. Hodgson. 31 Jan 73, 60p Rept no. RR-73-9
Contract N00014-68-A-0173-0013

Descriptors: (*Decision theory, Stochastic processes), (*Scheduling, Manpower), (*Naval aircraft, Maintenance), Hydraulic systems, Costs, Production control, Queueing theory, Probability density functions, Spare parts, Inventory control, Optimization, Computer programs, Naval Air Stations.
Identifiers: Markov decision processes, Markov processes, *Job shop scheduling, Job scheduling, Histograms, Digital simulation, Naval Air Rework Facilities, Jacksonville Naval Air Station.

In the paper a model of a hydraulic shop in a naval air rework facility is developed. First, job flows within the shop are identified. Then, the various mechanisms controlling job flow are quantified. This formulation is made in terms of the standard manhours of work in the system rather than the more traditional approach which deals with the number of jobs in the system. The system cost structure is presented. Finally, the model is formulated as a Markov decision process. Analysis of the structure of the optimal decision policy for the model reveals an interesting characteristic. The control structure has inertia (i.e., there is a reluctance to change the current policy in effect until it becomes absolutely necessary to do so). (Author)

AD-757 421 PC$3.00/MF$0.95
Florida Univ Gainesville Dept of Industrial and Systems Engineering
A NETWORK APPROACH TO A MULTI--FACILITY, MULTI-PRODUCT PRODUCTION SCHEDULING PROBLEM WITHOUT BACKORDERING.
Research rept.,
Robert C. Dorsey, Thom J. Hodgson, and H. Donald Ratliff. Jan 73, 24p* Rept no. RR-73-5
Contract N00014-68-A-0173-0013, Grant DA-ARO-D-31-124-70-G92-A
Sponsored in part by Contract N00014-68-A-0173-0017 and Grant DA-ARO-D-31-124-G183.

Descriptors: (*Production control, *Scheduling), Inventory control, Networks, Graphics, Costs, Mathematical programming, Multiple operation, Mathematical models, Optimization.
Identifiers: *Network flows, Integer programming, Backordering.

A multi-product, multi-facility production scheduling problem is considered over a finite planning horizon. The horizon consists of discrete production periods during each of which at most one product can be assigned to each facility. Product demand rates are assumed to be constant over a period but not necessarily identically in all periods. All demands must be met without allowing backorders. The problem objective is to deter-

mine an assignment of products to facilities over the horizon which minimizes the sum of production and inventory carrying charges. The problem is formulated as a network flow problem for which efficient solution procedures are known. However, for an important special case a single pass algorithm is given which is more efficient than the standard flow algorithms. (Author)

AD-757 428 PC$3.00/MF$0.95
Carnegie-Mellon Univ Pittsburgh Pa Management Sciences Research Group
ON THE SET COVERING PROBLEM. II. AN ALGORITHM.
Research rept. May-Nov 72,
Egon Balas, and Manfred Padberg. Nov 72, 37p Rept no. RR-295
Contract N00014-67-A-0314-0007
See also report dated Feb 70, AD-714 498.

Descriptors: (*Linear programming, Algorithms), Convex sets, Vector spaces, Simplex method, Graphics, Permutations, Theorems.
Identifiers: Integer programming, Graph theory, *Set covering problems.

In an earlier paper the authors proved that any feasible integer solution to the linear program associated with the equality-constrained set covering problem can be obtained from any other feasible integer solution by a sequence of less than m pivots (where m is the number of equations), such that each solution generated in the sequence is integer. However, degeneracy makes it difficult to find a sequence of pivots leading to an integer optimum. In the paper the authors give a constructive characterization of adjacency relations between integer vertices of the feasible set, which enables them to generate edges (all, if necessary) connecting a given integer vertex to adjacent integer vertices. This helps overcome the difficulties caused by degeneracy and leads to a class of algorithms of which two are discussed. (Author Modified Abstract)

AD-757 448 PC$3.00/MF$0.95
Wisconsin Univ Madison Mathematics Research Center
CONJUGACY CORRESPONDENCES: A UNIFIED VIEW.
Technical summary rept.,
L. McLinden. Feb 73, 37p Rept no. MRC-TSR-1297
Contract DA-31-124-ARO (D)-462

Descriptors: (*Mathematical programming, *Convex sets), Saddle point method, Vector spaces, Transformations (Mathematics), Functions, Theorems.
Identifiers: *Convex functions, Convex programming, *Conjugacy functions, *Duality theory, Saddle functions.

A new partial conjugacy correspondence is developed among saddle functions. Three known conjugacy correspondences, including Fenchel's correspondence among convex functions and Rockafellar's extension of it to saddle functions, are special cases. Various natural questions concerning the correspondence are answered. (Author)

AD-757 497 PC$3.00/MF$0.95
Florida State Univ Tallahassee Dept of Statistics
A CLASS OF PROGRAMMING PROBLEMS IN BANACH SPACES: CONCAVE OBJECTIVE FUNCTION WITH LINEAR CONSTRAINTS,
Chanchal Singh, and Morgan A. Hanson. Nov 72, 15p Rept no. FSU-Statistics-M244 AFOSR-TR-73-0475
Grant AF-AFOSR-2345-72

Descriptors: (*Nonlinear programming, Banach space), Convex sets, Theorems, Production control, Inventory control, Mathematical models.
Identifiers: Duality theory, Existence theorems, Continuous time programming, Constraints.

The report is a further extension of nonlinear programming to Banach spaces, and succeeds Report AFOSR-H No. 2. It generalizes the results of Hanson and Mond in continuous -time nonlinear programming of production-inventory control. Existence and duality theorems are established. (Author)

AD-757 499 PC$3.00/MF$0.95
Florida State Univ Tallahassee Dept of Statistics
CONTINUOUS TIME PROGRAMMING WITH NONLINEAR TIME DELAYED CONSTRAINTS,
William H. Farr, and Morgan A. Hanson. Dec 72, 35p Rept nos. FSU-Statistics-M248, H-5 AFOSR-TR-73-0476
Grant AF-AFOSR-2345-72

Descriptors: (*Nonlinear programming, Time-lag theory), Mathematical models, Convex sets, Matrix algebra, Production control, Power plants (Establishments), Water supplies, Theorems.
Identifiers: Duality theory, Constraints, Continuous time programming, Applications of mathematics.

A class of continuous time nonlinear programming problems relating to problems of acquisition, stockpiling, and distribution of materials is given. Nonlinearity appears in both the objective function and the constraints, and provision is made for time lags in the constraints. Necessary and sufficient conditions for the existence of solutions are established and optimal solutions are characterized in term of a duality theorem. (Author)

AD-757 615 Reprint
Stanford Univ Calif
HOMOTOPIES FOR COMPUTATION OF FIXED POINTS ON UNBOUNDED REGIONS,
B. Curtis Eaves, and Romesh Saigal. 20 Jun 72, 16p AROD-9736:1-M
Contract DAHC04-71-C-0041
Prepared in cooperation with California Univ., Berkeley. Sponsored in part by Grant NSF-GK-5695. Supersedes report dated Oct 71, AD-732 788.
Availability: Pub. in Mathematical Programming, v3 n2 p225-237 Oct 72.

Descriptors: (*Algebraic topology, Mathematical programming), Convex sets, Simplex method, Triangulation, Algorithms.
Identifiers: Homotopy theory, Computation, Fixed point theorems.

AD-757 665 PC$3.00/MF$0.95
Cornell Univ Ithaca N Y Dept of Operations Research
A NOTE ON A KERNEL AND THE CORE FOR GAMES WITHOUT SIDE PAYMENTS.
Technical rept.,
Louis J. Billera. Jun 72, 16p Rept no. TR-152
Contract N00014-67-A-0077-0014, Grant NSF-GK-29838

Descriptors: (*Game theory, Convex sets), Transformations (Mathematics), Theorems.
Identifiers: Penalty functions, N person games, Payment, Kernel functions.

A game without side payments is described via the support functions of the payoff sets. In this setting, a natural generalization of the Davis-Maschler Kernel is defined and nonemptiness is shown. The relationship between the side payment and non side payment theories of the core is also discussed. (Author)

AD-757 666 PC$3.00/MF$0.95
Cornell Univ Ithaca N Y Dept of Operations Research
A GENERALIZED DISCRIMINATORY SOLUTION FOR A CLASS OF N-PERSON GAMES.
Technical rept.,
Robert James Weber. Feb 73, 23p Rept no. TR-174
Contract N00014-67-A-0077-0014, Grant NSF-GK-29838
Sponsored in part by Grant NSF-GP-32314.

Descriptors: (*Game theory, Theorems), Inequalities, Set theory, Stability.
Identifiers: N person games, Discrimination, Von Neumann-Morgenstern theorem.

A discriminatory solution for an n-person game is a von Neumann-Morgenstern stable set in which some player receives a fixed payoff in all outcomes. In the paper a generalization of the discriminatory solution is defined, and solutions of this type are given for all games in which only coalitions of 1, n-1, or n players are vital. (Author)

AD-757 667 PC$3.00/MF$0.95
Cornell Univ Ithaca N Y Dept of Operations Research
DISCRIMINATORY SOLUTIONS FOR (N,N-2-)-GAMES.
Technical rept.,
Robert James Weber. Mar 73, 19p Rept no. TR-175
Contract N00014-67-A-0077-0014, Grant NSF-GP-32314
Sponsored in part by Grant NSF-GK-29838.

Descriptors: (*Game theory, Theorems), Inequalities, Set theory, Theorems.
Identifiers: N person games, Discrimination, Von Neumann-Morgenstern theorem.

An (n,m)-game is an n-person game in which all coalitions with less than m players are not vital. A p-discriminatory solution to a game is a von Neumann-Morgenstern stable set solution in which some p players always receive fixed payoffs. In the paper, necessary and sufficient conditions are given for an arbitrary (n,n-2)-game to have a k-discriminatory solution. These conditions are used to characterize all 2-discriminatory solutions for 4-person games, and for the simple (n,n-2)-games in which all coalitions with at least n-2 players are winning coalitions. (Author)

AD-757 703 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
COMPARISON OF THREE RULES OF THUMB TO THE OPTIMAL SOLUTION IN INVESTIGATION THEORY - WITH SAMPLE PROBLEMS.
Technical rept.,
Stephen J. Balut, and Gilbert T. Howard. Jan 73, 27p Rept no. NPS-55HK73011A

Descriptors: (*Scheduling, Mathematical models), Sequences, Graphics, Optimization.
Identifiers: Job shop scheduling, Shortest route method, Investigations, Branch and bound method, *Sequencing.

The investiation problem considered here is one in which there is an investigator in a region with several objects, all of which are attempting to cross a specific boundary of the region. The investigator is to investigate as many of the objects as possible before they cross the boundary. In the paper it is assumed that all objects are moving parallel to one another directly toward the boundary. The investigator has speed greater than the objects, and can change his course instantaneously. Forth sample problems with 20 objects each were randomly generated and solved optimally using branch and bound methods previously developed by the authors. In the first twenty problems, all targets have the same speed. In the second set of twenty problems, the target speeds differ. Solutions for the same problems were obtained through application of three easily implemented rules of thumb is determined through comparison of results with the optimal solutions. (Author)

13. MECHANICAL, INDUSTRIAL,

CIVIL, AND MARINE ENGINEERING

13A. Air Conditioning, Heating, Lighting, and Ventilating

AD-757 365 PC$3.00/MF$0.95
Research Triangle Inst Durham N C Operations Analysis Dept
STUDY OF AIR DISTRIBUTION IN LARGE PARTITIONED SHELTERS.
Final rept. Nov 71-Feb 73,
Milton D. Wright, Edward L. Hill, and Gerald M. Botkin. Feb 73, 116p Rept no. RTI-43U-629-2
Contract DAHC20-71-C-0275

Descriptors: (*Fallout shelters, Ventilation), (*Cooling + ventilating equipment, Civil defense systems), Ventilation fans, Pumps, Gas flow, Air intake filters, Anemometers, Tests.
Identifiers: *Manually powered equipment.

The report describes experimental studies performed to determine the effect of manually powered ventilation equipment when used to ventilate large partitioned shelters. The equipment used consisted of a 30-inch fan and an air distributional device called a Kearny pump. For each of seven different floor plans, the equipment was operated using various configurations of apertures for air inlet and exhaust. During each test, airflow rate measurements were taken at heights of three feet and six feet above floor level using hot wire anemometers at measurement points marked off on the floor of the test facility. These measurements were used to develop iso-speed contours for airflow rates of 20 fpm and 40 fpm over the floor area of the test facility. Based on the results of these tests, it was concluded that the manually powered equipment can be used to effectively ventilate large, partitioned shelters for most floor plans and aperture configurations tested. (Author Modified Abstract)

AD-757 675 PC$3.00/MF$0.95
Naval Civil Engineering Lab Port Hueneme Calif
TUNNEL VENTILATION AND HEAT CONTROL IN UNDERSNOW CAMPS-BYRD STATION, ANTARCTICA.
Final rept. Sep 65-Jun 72,
C. R. Hoffman. Feb 73, 50p Rept no. NCEL-TR-783

Descriptors: (*Underground structures, Ventilation), (*Construction, *Polar regions), Deformation, Ventilation ducts, Heat sinks, Cooling, Heat transfer, Atmospheric temperature, Efficiency.
Identifiers: *Snow tunnels, Byrd Station, *Undersnow camps, *Tunnel ventilation.

Antarctic stations located in tunnels beneath the snow surface, such as the South Pole Station and the recently closed Byrd Station, are of limited useful life because of snow deformation in the tunnel walls and roof. This deformation accelerates as snow temperature increases, which makes the control of heat gain very important. Studies of temperature control methods in snow tunnels were conducted at Byrd Station from December 1965 to October 1971 and demonstrated that the use of large-diameter gravity ventilation ducts from the tunnel to the surface is an effective method for venting unwanted heat when surface air temperatures are lower than the desired tunnel temperature. When surface air temperatures are too warm, large volumes of supplemental cooling air can be obtained from specially constructed systems utilizing the heat sink represented by the surrounding snowfield. Byrd Station tunnel temperatures are evaluated during use of different ventilating methods. (Author Modified Abstract)

AD-757 684 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
INVESTIGATION OF THE PERFORMANCE OF A GAS-LOADED VARIABLE CONDUCTANCE HEAT PIPE.
Master's thesis,
Keith Earl Reynolds. Dec 72, 79p

Descriptors: (*Heat exchangers, Gases), Thermal conductivity, Thermal analysis, Gravity, Mathematical models, Computer programs, Theses.
Identifiers: *Heat pipes.

A variable conductance heat pipe was designed and constructed to study the performance characteristics of the gas loaded heat pipe with particular emphasis on the effect of gravity. Heat inputs were varied from 10 to 50 watts and the operating position of the pipe was varied from horizontal to vertical with the condenser above the evaporator. Condenser temperature profiles are presented for various heat inputs and positions for the conventional and gas loaded heat pipe. The possibility of stratification in a horizontal heat pipe operating with a non-condensable gas that has a larger molecular weight than the working fluid is discussed based on observations presented. (Author Modified Abstract)

PATENT-3708419 Not Available - NTIS
North American Rockwell Corp., Downey, Calif.
SELF-CYCLING FLUID HEATER.
Patent
W. K. Moen. Patented 2 Jan 73, 9p
NASA-CASE-MSC-15567-1
FILED 6 Nov. 1970 Supersedes N72-15893 (10 - 06, P 0835)
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Heating equipment, Patents.
Identifiers: PAT.CL. 204-328.

A self-cycling fluid heater is described which includes a high temperature upstream preheater for elevating the stream temperature. A high intensity jet arc heater heats the preheated fluid stream to ultrahigh reaction temperatures and discharges the stream into an electric resistance tubular heat exchanger. The heat exchanger has variations in wall thickness at measured intervals along its length to control the temperature of the fluid passing through the heat exchanger for desired time intervals to provide the specified chemical reactions desired.

13B. Civil Engineering

AD-757 116 PC$4.85/MF$0.95
Physics International Co San Leandro Calif
FULL-SCALE FIELD TEST RESULTS OF THE REAM CONCEPT FOR HARD ROCK EXCAVATION.
Final rept. 17 Dec 71-12 Nov 72,
John D. Watson. Jan 73, 78p* Rept no. PIFR-391
Contract HO220015, ARPA Order-1579

Descriptors: (*Hypervelocity projectiles, Effectiveness), (*Underground structures, Construction), Rock (Geology), Removal, Projectiles, Design, Self-propelled guns, Impact, Cost effectiveness.
Identifiers: *Rapid excavation, REAM (Rapid Excavation And Mining), Rapid excavation and mining, Tunneling, Performance evaluation.

The report describes the results of the full-scale field tests of the REAM concept for hard rock excavation. REAM is an innovative method of rock disintegration which utilizes the impact energy of high velocity projectiles to fracture and eject the rock. The concept was demonstrated by driving a 13-foot-diameter tunnel to a depth of 26 feet in a granitic rock formation at Hope Valley, California. The average mass of rock removed by the 10-pound concrete projectiles impacting at 5000 ft/sec was 3000 pounds. In addition to presenting the rock breakage data, this report discusses the characteristics of the impact ejecta, muck distribution, and wall contour control. (Author Modified Abstract)

AD-757 120 PC$3.75/MF$0.95
Terraspace Inc Rockville Md
OPTIMIZING THE EFFICIENCY OF ROCK DISINTEGRATION BY LIQUID JETS.
Final rept. Jul-31 Dec 72,
William C. Cooley, and Paul E. Brockert. 22 Dec 72, 34p Rept no. TR-4051
Contract HO230005, ARPA Order-1579

Descriptors: (*Liquid jets, Efficiency), (*Rock (Geology), *Cratering), Nozzles, Nozzle area ratio, Pistons, Design, Experimental data, Pressure, Optimization.
Identifiers: *Rock disintegration, Stagnation pressure.

The report covers experimental research in producing craters in large Barre granite samples by the use of pulsed high pressure water jets. Two exponential nozzles of the type developed by Prof. Voitsekhovsky in the USSR were used: A Russian-made nozzle with an exit diameter of 7.16 mm and an American-made nozzle with an exit diameter of 6 mm. Water was expelled from the nozzles by firing steel pistons from a nitrogen gas gun of 3.25 inch bore. (Author Modified Abstract)

AD-757 138 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
EFFECTIVE HYDRAULIC ROUGHNESS FOR CHANNELS HAVING BED ROUGHNESS DIFFERENT FROM BANK ROUGHNESS: A STATE OF THE ART REPORT.
Final rept.,
Robert G. Cox. Feb 73, 64p Rept no. AEWES-Misc-Paper-H-73-2

Descriptors: (*Hydraulic systems, Fluid flow), Turbulence, Walls, Surface roughness, Hydrology, Reynolds number, State-of-the-art reviews.
Identifiers: Channels (Waterways), Channel flow, Channel stabilization, Flood control, *Open channel flow.

The report summarizes two numerical studies, one laboratory experimental study, and one analytical study of flow resistance in rectangular channels having one type or degree of boundary roughness on the bed and a second type or degree of roughness on the sidewalls. The numerical study showed that usual procedures for estimating resistance coefficients for channels of this type are not adequate. The laboratory study indicated that the relations between the effective Manning's n , the sidewall Manning's n , the bed Manning's n , and the channel geometry could be established empirically by extensive laboratory testing. The analytical study proved that laboratory studies using a smooth surface for one of its boundaries had little application to practical design problems. It also showed that the best solution to the problem probably would result by use of hydraulic roughness values to describe the boundary surfaces. The study showed that relatively large errors in estimating the hydraulic roughness effect only minor errors in capacity design. (Author)

AD-757 147 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
WAVE TRANSMISSION THROUGH ROCK STRUCTURES. HYDRAULIC MODEL INVESTIGATION.
Final rept.,
Garbis H. Keulegan. Feb 73, 79p Rept no. AEWES-RR-H-73-1

Descriptors: (*Breakwaters, Wave transmission), (*Hydraulic models, Breakwaters), Model tests, Ocean waves, Reflection, Flow fields, Equations of motion, Water waves.
Identifiers: *Jetties.

Application of the energy method leads to a theoretical expression of the coefficient of transmission through a prismatic structure, constructed from rocks of uniform size, for long waves traversing the structure. When the dissipation in the voids is due partly to turbulent forces, the transmissions are expressed by a power formula. The formula is modified by a parametric factor to respond to the conditions met with in the ordinary model studies of the shorter waves. The factor form is determined from observations made with waves of varying periods. The relation of the adapted formula to the resistance of the structures for steady flow is shown. With the reflections not being amenable to an analytical treatment, test results are consolidated in a single curve, irrespective of the rock sizes, with the porosity remaining constant. (Author)

AD-757 157 PC$6.75/MF$0.95
Army Engineer Waterways Experiment Station Livermore Calif Explosive Excavation Research Lab
ANNOTATED BIBLIOGRAPHY OF EXPLOSIVE EXCAVATION RELATED RESEARCH.
Bibliography 1 Jul 62-30 Jun 72,
Richard H. Gates, Richard W. Mattes, Richard K. Knowles, Ralph E. Burkett, and William T. Fisher. Jul 72, 219p* Rept no. EERL-TR-E-72-32

Descriptors: (*Nuclear industrial applications, *Bibliographies), (*Construction, *Nuclear explosions), Cratering, Civil engineering, Underground explosions, Underwater explosions, Geology, Soil mechanics, Abstracts.
Identifiers: Plowshare operation, Nuclear excavation, Chemical explosives.

The bibliography contains a description of all reports prepared by the USAE Nuclear Cratering Group (NCG), the USAE Waterways Experiment Station Explosive Excavation Research Office (EERO), and the USAE Waterways Experiment Station Explosive Excavation Research Laboratory (EERL) from Fiscal Year 1962 through Fiscal Year 1972. The reports address themselves to the many topics associated with the use of chemical and nuclear explosives in excavation projects, and each is described by a brief summary or abstract. Indexing is by subject, author, title, and report number. (Author)

AD-757 335 PC$3.00/MF$0.95
Naval Air Development Center Warminster Pa Air Vehicle Technology Dept
CHEMICAL COMPOSITION OF WATER SUPPLIES TO NAVAL AND MARINE CORPS AIR STATIONS.
Phase rept.,
William C. Hallow. 20 Dec 72, 25p Rept no. NADC-72260-VT
Contract A34-534/200/1F32-461-406

Descriptors: (*Naval air stations, *Water supplies), (*Naval aircraft, Cleaning), Marine Corps, Aircraft, Chlorides, pH, Concentration (Chemistry).
Identifiers: Dissolved solids, Rinsing, Military air facilities, *Water quality data.

A survey was made of the water quality at Naval and Marine Corps Air Stations both within the United States and overseas to aid in the design and location of new water rinse facilities for aircraft. (Author)

AD-757 378 PC$3.00/MF$0.95
Committee on Tidal Hydraulics (Army) Washington D C
UNPUBLISHED CONSULTATION REPORTS ON CORPS OF ENGINEERS TIDAL PROJECTS.
Dec 66, 54p Rept no. Technical Bull-12

Descriptors: (*Inland waterways, Maintenance), Harbors, Hydraulic models, Echo sounding, Navigation, Drainage, Civil engineering, Rivers, Sea water, Beaches, Tides, Salinity, Flowmeters, Bays, Reports.
Identifiers: Dredging, Shoaling.

Contents: Index of projects on which the committee on tidal hydraulics has rendered consultative services (February 1949 to June 1966); Echo sounding equipment vs. lead-line soundings; Shoaling at the mouth of Columbia River; Data collection program, Southwest Pass, Mississippi River; Shoaling in Savannah River Harbor; Passamaquoddy study; Proposed study for observing factors which affect navigation conditions at the proposed Matagorda (ship channel); Proposed study for observing factors which affect navigation conditions at the proposed Matagorda Bay ship channel; Matagorda Bay ship channel; Proposed access channel, Oregon Inlet to intracoastal waterways, North Carolina; Salt-water intrusion in Lake Washington ship canal; Shoaling in Gulfport ship channel.

AD-757 379 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
ULTIMATE STRAIN CAPACITY AND TEMPERATURE RISE STUDIES, TRUMBULL POND DAM.
Final rept.,
James E. McDonald, Anthony A. Bombich, and Billy R. Sullivan. Aug 72, 85p Rept no. AEWES-Misc-Paper-C-72-20

Descriptors: (*Dams, Thermal stresses), (*Concrete, Thermal stresses), Thermal expansion, Strain (Mechanics), Tensile properties, Loading (Mechanics), Cracks, Failure (Mechanics), Temperature, Mixtures, Correlation techniques, Mathematical prediction.
Identifiers: Trumbull Pond Dam, Finite element analysis, Computer aided analysis.

Pertinent physical properties of two interior mass concrete mixtures were determined and used as input to a finite-element computer code for prediction of temperature rise in mass concrete. Potential tensile strains were computed based on the temperature history and coefficient of thermal expansion. Comparison of these computed strains with the results of the ultimate strain capacity tests indicates where potentially critical strains could occur if movement were restrained. Information obtained in this investigation provides a basis for the establishment of some of the temperature and construction control plans aimed toward minimizing thermal cracking. (Author Modified Abstract)

AD-757 386 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
VIBROSEISMIC SURVEY, RAILROAD TEST EMBANKMENT, AIKMAN, KANSAS,
Joseph R. Curro, Jr. Jun 72, 93p Rept no. AEWES-Misc-Paper-S-72-36

Descriptors: (*Revetments, Soil mechanics), (*Railroads, Revetments), Foundations (Structures), Test methods, Seismic waves, Attenuation, Vibration, Compressive properties, Modulus of elasticity, Kansas.
Identifiers: Embankments, Seismic refraction method, Vibration tests, Aikman (Kansas), Graphs (Charts).

The report describes a vibroseismic survey to provide seismic information pertinent to the soil conditions and elastic properties of the Kansas Test Track, Aikman, Kansas, and for limited laboratory tests. The report presents the results of the vibroseismic survey which was performed during the period 28 September - 9 October 1971.

AD-757 390 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
PRESSURE CELL TESTS BULL SHOALS DAM STILLING BASIN.
Feb 54, 26p Rept no. AEWES-Misc-Paper-2-77

Descriptors: (*Dams, Hydrostatic tests), Pressure gages, Damage, Fluid flow, Test methods, Arkansas.
Identifiers: *Stilling basins, White River, Bull Shoals Dam.

Damage to the Bull Shoals Dam stilling basin during normal operation resulted in the Development of pressure cells to determine the causes. The report describes the design, installation, and operation of these cells.

AD-757 395 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
INVESTIGATION OF RELIEF WELLS, MISSISSIPPI RIVER LEVEES, ALTON TO GALE, ILLINOIS.
Final rept.,
R. L. Montgomery. Jun 72, 119p Rept no. AEWES-Misc-Paper-S-72-21

Descriptors: (*Levees, Drainage), (*Water wells, Hydrology), Floods, Hydraulic systems, Chemical analysis, Bacteria, Test methods, Performance (Engineering), Efficiency, Tables, Illinois.
Identifiers: Mississippi River, Seepage.

Pumping tests, chemical and biological analyses of water samples, and well screen inspection by means of a borehole TV camera were conducted in 1969 as part of a study of the efficiency of the relief well system along the Mississippi River between Alton and Gale, Illinois. The purposes of this study are to determine the extent and causes of well deterioration and to investigate methods for improving and maintaining the efficiency of the well system. The relief wells were designed by personnel of the U. S. Army Engineer Waterways Experiment Station and built under the supervision of the U. S. Army Engineering District, St. Louis (SLD). The wells included in this investigation were installed between 1953 and 1955. Since then, SLD has performed a series of well pumping tests, periodically inspected the relief well system, and observed the operation of the wells during high river stages of the Mississippi River. (Author Modified Abstract)

AD-757 396 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
SEEPAGE IN MISSISSIPPI RIVER BANKS. REPORT 1. ANALYSIS OF TRANSIENT SEEPAGE USING VISCOUS FLOW MODEL AND NUMERICAL METHODS,
Chandrakant S. Desai. Feb 70, 71p Rept no. AEWES-Misc-Paper-S-70-3-1

Descriptors: (*Rivers, Revetments), (*Revetments, Soil mechanics), Model tests, Mathematical models, One-dimensional flow, Two-dimensional flow, Equations of motion, Transients.
Identifiers: Mississippi River, Seepage, Finite element analysis, Viscous flow.

The design of stable riverbank slopes along the Mississippi River is dependent upon the seepage conditions within the banks generated by varying river level, including sudden drawdown. Available seepage analyses are not adequate for the determination of the continuously changing free-water surface under time-dependent variations in river levels. A parallel plate viscous flow model was constructed and tested and was found to constitute a reliable means of obtaining the transient free surface within a sloping bank. Two series of model tests were performed using a vertical upstream face and an upstream slope of 45 degrees. (Author Modified Abstract)

AD-757 397 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
RAPID ROAD CONSTRUCTION USING MEMBRANE ENVELOPED SOIL LAYERS.
Final rept. Jul 69-Jan 71,

Alfred H. Joseph, Ralph D. Jackson, and Steve L. Webster. Feb 73, 79p* Rept no. AEWES-Misc-Paper-S-73-5

Descriptors: (*Soils, Encapsulation), (*Roads, Foundations (Structures)), Construction, Earth-handling equipment, Membranes, Thermosetting plastics, Sealing compounds, Asphalt, Trafficability.
Identifiers: Pavement bases, Polypropylene.

Military roads require high-strength foundation layers to support ground vehicles in the theater of operations (TO). In many instances, sizable construction effort and costs are required in obtaining material and producing suitable roads. New road building techniques are needed to reduce the construction time and costs of these roads. The objective of this investigation was to develop construction techniques and procedures for employing a membrane-enveloped soil layer (MESL) as a base course to allow rapid road construction in the TO. Construction techniques for encapsulating in situ or locally available fine-grained soils in waterproof membranes were developed. A test road was built containing both MESL and conventional-type base courses. Traffic tests were conducted, and construction requirements for MESL base courses were determined. (Author Modified Abstract)

AD-757 398 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
ENTRANCE CHANNEL CURRENTS NAVAL OPERATING BASE MIDWAY ISLANDS. MODEL INVESTIGATION.
Technical memo.
Feb 48, 122p Rept no. AEWES-TM-2-251

Descriptors: (*Harbors, *Hydraulic models), Midway, Harbor models, Model tests, Breakwaters, Ocean currents, Ocean waves, Photographs, Tables, Midway.

The report describes a hydraulic model study of the problem of reducing to a minimum the hazardous navigation conditions at the mouth of the entrance channel, Midway Islands. An investigation of navigation conditions in the channel had been made before the model study was proposed. However, this investigation was primarily to provide navigators with information on sailing conditions in the channel during storms. The data obtained included the magnitude and direction of entrance channel currents, storm-wave characteristics at various locations around the barrier reef, records from two automatic tide gages, and meteorological data.

AD-757 399 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
EFFICACY OF PARTIAL CUTOFFS FOR CONTROLLING UNDERSEEPAGE BENEATH LEVEES.
Technical memo.
Jan 49, 82p Rept no. AEWES-TM-3-267

Descriptors: (*Levees, Drainage), Model tests, Foundations (Structures), Soil mechanics, Hydrostatic pressure.
Identifiers: Seepage.

The Waterways Experiment Station conducted a series of sand and electrical model tests to study the effect of partial cutoffs on underseepage flow and substratum pressures landward of levees for various foundation conditions, seepage entrances, and landside top strata. The study also included the use of graphical flow nets and mathematical formulas for analyzing the effec's of partial cutoffs on underseepage for some of the foundation conditions.

AD-757 402 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
STUDY OF RELIEF WELL INSTALLATIONS AT WOLF RIVER AND NONCONNAH CREEK PROJECTS, MEMPHIS, TENNESSEE. VOLUME 1.
Technical memo.,
J. A. Focht, W. C. Sherman, and C. I. Mansur. Feb 52, 91p Rept no. AEWES-TM-3-247
Revision of report dated Dec 47.

Descriptors: (*Levees, Drainage), (*Water wells, Hydrology), Floods, Control systems, Soil mechanics, Hydrostatic pressure, Fluid flow, Hydraulic systems, Efficiency, Performance (Engineering), Tennessee.
Identifiers: Wolf River, Nonconnah Creek, Memphis (Tennessee), Seepage.

The main report describes the characteristics and operation of the relief well systems at Wolf River and Nonconnah Creek projects, Memphis, Tennessee, and summarizes the principal design features of the well system. Various factors influencing the design and operation of the wells are discussed. Appendix A contains an analysis of the performance of the well systems during high water in 1943, 1944, 1945, and 1947. An analysis of the high-water period in January and February 1950 is presented in Appendix B. An analysis of field pumping tests conducted in 1948, 1949, and 1950 is contained in Appendix C. Appendix D is an analysis of field pumping tests performed in 1951 to determine the efficiency of the wells and effectiveness of various cleaning agents for restoring the capacity of the wells to their former value.

AD-757 403 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
FLOOD-CONTROL PROJECT HOOSIC RIVER, NORTH ADAMS MASSACHUSETTS.
Technical memo.
Jun 62, 156p Rept no. AEWES-TM-2-338-2
Includes Report no. 1.

Descriptors: (*Dams, *Hydraulic models), Model tests, Floods, Photographs, Massachusetts.
Identifiers: Hoosic River, North Adams (Massachusetts), Flood control, Channel improvements.

Model investigations of the proposed channel improvements for flood control on the Hoosic River at North Adams, Massachusetts, were conducted to supplement and verify hydraulic computations for the initial design or to develop alterations effecting greater hydraulic efficiency or reduction in construction costs. A 1:30-scale model was used to check such design features as chute alignment, superelevation in bends, hydraulic performance of stilling basin, weir, and transitions, requirements for intakes and outlets, wall heights, and elevations of bridges.

AD-757 406 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
PRESERVATION AND ENHANCEMENT OF NIAGARA FALLS: HYDRAULIC MODEL INVESTIGATION.
Technical memo Nov 50-Jan 53.
Jul 55, 152p Rept no. AEWES-TM-2-411

Descriptors: (*Hydraulic models, Rivers), Feasibility studies, Water supplies, Power plants (Establishments), Natural resources.
Identifiers: *Niagara Falls.

The Niagara River and Falls model study was conducted for the purposes of (a) determining the effects on the Niagara River and Falls of additional diversions of water for power, (b) determining the type of remedial works required, and (c) developing plans for preservation of the scenic beauty of the Falls. The study was conducted on a fixed-bed-type model constructed to linear scale ratios, model to prototype, of 1 to 360 horizontally and 1 to 60 vertically. The model reproduced the 26-mile reach of the Niagara River extending from approximately 11,500 ft above Peace Bridge (opposite Buffalo, N. Y.) to Rainbow Bridge about 5000 ft below the Falls. (Author)

AD-757 407 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
INVESTIGATION OF MASS PLACEMENT OF SAND ASPHALT FOR UNDERWATER PROTECTION OF RIVER BANKS.
Technical memo.
Aug 51, 112p Rept no. AEWES-TM-3-329

Descriptors: (*Rivers, Erosion), Bituminous coatings, Sand, Mixtures, Thickness, Deformation, Protection, Underwater, Costs, Penetration, Asphalt.
Identifiers: Dikes, Revetments, Shore protection, Aggregates.

The general objective was to determine those properties of the asphalt mixture dropped in a mass under water which will give the best coverage, considering spread, thickness, strength or resistance to disintegration, deformability in conforming and reforming as the river bed scours, to river-bed irregularities, velocity of the water, depth of placement, and economy of placement. (Author Modified Abstract)

AD-757 408 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
A LABORATORY DEVELOPMENT OF CAVITATION-FREE BAFFLE PIERS BLUESTONE DAM, NEW RIVER, WEST VIRGINIA.
Mar 48, 96p Rept no. AEWES-TM-2-243

Descriptors: (*Dams, *Hydraulic models), Model tests, Turbulence, Erosion, West Virginia.
Identifiers: New River, Spillways, *Stilling basins.

Model studies of the stilling basin for Bluestone Dam, New River, West Virginia, were conducted at the Waterways Experiment Station in 1941-42 for the Huntington District, CE. The general purpose of the studies was to investigate the possibility and probable extent of destructive cavitation action on the Bluestone stilling-basin elements of original design, with the spillway in operation. It was also desired, if possible, to develop means of correcting any unsafe or undesirable conditions found to exist in the stilling basin as designed.

AD-757 409 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
CONTROL OF UNDERSEEPAGE BY RELIEF WELLS, TROTTERS, MISSISSIPPI. APPENDIX D. ANALYSIS OF 1955 WELL FLOW AND PIEZOMETRIC DATA. APPENDIX E. 1957 PUMPING TESTS.
Technical memo.,
R. I. Kaufman, and J. D. Perrine. Jun 57, 46p Rept no. AEWES-TM-3-341-App-D/E
See also Appendix B/C - AD-756 425.

Descriptors: (*Levees, Drainage), (*Water wells, Hydrology), Fluid flow, Soil mechanics, Sedimentation, Mississippi.
Identifiers: Mississippi River, Trotters (Mississippi), Seepage.

In 1950 an experimental relief well system was installed along the landside toe of the levee at Trotters (Mi 54), Mississippi to study the control of underseepage by means of relief well and the performance of a well system over a extended period of time. Appendix D contains the analysis and summary of piezometric and well flow data obtained during the high water of March-April 1955. Appendix E presents the description and analysis of pumping tests made on selected wellsduring February and March 1957 to compare the yield of

certain wells with that obtained in 1950 when the wells were installed.

AD-757 410 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
FILLING AND EMPTYING SYSTEM OLD RIVER NAVIGATION LOCK LOUISIANA. HYDRAULIC MODEL INVESTIGATION.
Technical rept.,
J. H. Ables, Jr., and F. R. Brown. Jun 60, 86p Rept no. AEWES-TR-2-549

Descriptors: (*Dams, *Hydraulic models), (*Rivers, Navigation), Model tests, Hydraulic systems, Fluid flow, Statistical data, Tables, Louisiana.
Identifiers: Old River, *Locks (Waterways).

The filling and emptying system of the 1200- by 75-ft Old River Lock will consist of wall intake manifolds; a 13.5- by 13.5-ft longitudinal culvert in each wall; reverse-tainter, multispeed culvert valves; side-wall ports; and a bottom lateral discharge manifold. Normal heads will range from 5 to 15 ft, with a maximum probable head of 32 ft. The entire lock hydraulic system was tested in a composite 1:25-scale model, simulating all essential features of the prototype structure, to determine: (a) adequacy of intake and discharge manifold designs; (b) maximum permissible lock-filling and -emptying rates at which turbulence and hawser stresses would not be dangerous; (c) best location and spacing of side-wall ports; and (d) best location of the bulkhead slot below the culvert filling valves.

AD-757 411 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
SPILLWAYS AND STILLING BASINS, JACKSON DAM, TOMBIGBEE RIVER, ALABAMA: HYDRAULIC MODEL INVESTIGATION.
Technical rept. Nov 56-Jul 57,
A. P. Rollins, Jr., Edmund H. Lang, J. B. Tiffany, and E. P. Fortson, Jr. Jan 60, 35p Rept no. AEWES-TR-2-531

Descriptors: (*Dams, *Hydraulic models), Model tests, Fluid flow, Hydraulic systems, Alabama.
Identifiers: Stilling basins, Spillways, Tombigbee River, Jackson Dam.

Performance of gated and fixed-crest spillways and stilling basins for the Jackson Dam was studied on two section models constructed to undistorted scales of 1:50 and 1:36, respectively. The stilling basin below the gated spillway is to be a split-level horizontal apron with a low end sill. The basin below the fixed-crest spillway will consist of a small roller bucket. In general, the spillways and stilling basins were found to function satisfactorily as originally designed; however, revisions were tested in an attempt to improve basin performance and reduce construction costs.

AD-757 412 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
CULVERT TAINTER VALVES, NEW LOCK NO. 19, MISSISSIPPI RIVER: HYDRAULIC MODEL INVESTIGATION.
Technical rept. Jul 57-Jul 58,
J. R. Ables, Jr., and T. E. Murphy. Jun 51, 67p Rept no. AEWES-TR-2-537

Descriptors: (*Dams, Hydraulic valves), (*Hydraulic models, Dams), Model tests, Fluid flow, Hydrostatic pressure, Loading (Mechanics), Statistical data, Tables, Iowa.
Identifiers: *Locks (Waterways), Culverts, Radial gates, Mississippi River, Keokuk (Iowa).

Trial operations of the filling and emptying system of new Lock No. 19 on the Mississippi River at Keokuk, Iowa, revealed severe load pulsations on the culvert valves, which resulted in intermittent reversals in loading on the valve hoist and a consequent clattering in the operating machinery. These pulsations were so severe at large valve openings that it was deemed risky to operate the valves at openings greater than about two-thirds. A 1:12-scale model of one of the reverse-tainter type culvert valves was used to study causes of load reversals on the hoist and to develop valve modifications that would eliminate clattering and permit normal operation of the valves.

AD-757 413 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
NAVIGATION CONDITIONS AT JACKSON LOCK AND DAM, TOMBIGBEE RIVER, ALABAMA. HYDRAULIC MODEL INVESTIGATION.
Technical rept. Sep 56-Mar 58,
J. J. Franco, and J. E. Glover. Jan 60, 65p Rept no. AEWES-TR-2-532

Descriptors: (*Dams, *Hydraulic models), Rivers, Model tests, Inland waterways, Fluid flow, Alignment, Feasibility studies, Alabama.
Identifiers: Jackson Dam, Tombigbee River, Locks (Waterways).

Jackson lock and dam will replace three out-of-date, small, low-lift locks and dams on the Tombigbee River. The lock is to be of the high-lift type with chamber dimensions of 110 by 600 ft, and will be located in the right bank about 600 ft landward of the river's edge. Model tests were conducted on a 1:120-scale model that reproduced approximately 2.3 miles of the river and the lock and dam structure. The model investigation was concerned principally with navigation conditions in the upper and lower lock approaches and over the fixed-crest spillway under various flow conditions, and determination of the best dredging plan, lock wall arrangements, and methods of overcoming any undesirable conditions. Another purpose of the model was to permit navigation interests to observe the structure in operation and satisfy themselves of its acceptability from a navigation standpoint. (Author Modified Abstract)

AD-757 472 PC$3.00/MF$0.95
Little (Arthur D) Inc Cambridge Mass
PRELIMINARY SYSTEM DEVELOPMENT. CHEMICAL HAZARDS RESPONSE INFORMATION SYSTEM (CHRIS).
Final rept. Nov 70-May 72,
D. S. Annan, G. H. Harris, G. R. Schimke, and R. W. Neal. May 72, 82p Rept no. ADL-73096-1
Contract DOT-CG-03223-A
See also AD-757 473.

Descriptors: (*Water pollution, *Information retrieval), (*Hazards, Water pollution), (*Shipping (Marine), Water pollution), Accidents, Response, Chemicals, Wastes (Industrial), Systems engineering.
Identifiers: *CHRIS (Chemical Hazards Response Information System), *Hazardous materials, Contingency plans, *Information systems, *Water pollution abatement, Recommendations, Hazardous materials transportation, Chemical hazards response information system.

The report describes the results of the preliminary system development of a Chemical Hazards Response Information System (CHRIS). This system is designed to satisfy the information needs of Coast Guard field personnel when responding to emergencies involving the accidental release of hazardous chemicals into the water. It will also serve non-emergency needs as they apply to the development of improved safety in the water transport of hazardous chemicals. (Author)

AD-757 473 PC$3.00/MF$0.95
Little (Arthur D) Inc Cambridge Mass
CHRIS APPENDIXES I - VI. (PRELIMINARY SYSTEM DEVELOPMENT - CHEMICAL HAZARDS RESPONSE INFORMATION SYSTEM - CHRIS).
Final rept. Nov 70-May 72.
May 72, 280p Rept nos. ADL-73096-1A, ADL-730961B
Contract DOT-CG-03223-A
Also includes ADL-730961C, ADL-730961D, ADL-730961E, and ADL-730961F. See also AD-757 472.

Descriptors: (*Water pollution, *Information retrieval), (*Hazards, Water pollution), (*Shipping (Marine), Water pollution), Accidents, Chemicals, Wastes (Industrial), Systems engineering, Data, Response.
Identifiers: *CHRIS (Chemical Hazards Response Information System), *Hazardous materials, *Information systems, *Water pollution abatement, Manuals, Contingency plans, Assessments, Personnel, Hazardous materials transportation, Chemical hazards response information system.

The report contains Appendixes I - VI to the final report on CHRIS. The appendixes contain descriptions of and preliminary specifications for 5 supporting manuals for CHRIS: I - A condensed guide to chemical hazards; II - Hazardous chemical data; III - Regional contingency plan data base; IV - Hazard assessment handbook; V - Response methods handbook. Appendix VI contains a description and recommendations for the organization required to support and maintain CHRIS.

AD-757 474 PC$3.00/MF$0.95
Little (Arthur D) Inc Cambridge Mass
CHRIS APPENDIX VII - SUPPORTING INFORMATION. (PRELIMINARY SYSTEM DEVELOPMENT - CHEMICAL HAZARDS RESPONSE INFORMATION SYSTEM - CHRIS).
Final rept. Nov 70-May 72,
May 72, 243p Rept no. ADL-73096-1G
Contract DOT-CG-03223-A
See also AD-757 473 and AD-757 472.

Descriptors: (*Water pollution, *Information retrieval), (*Hazards, Water pollution), (*Shipping (Marine), Water pollution), Response, Chemicals, Wastes (Industrial), Systems engineering, Design, Statistical data, Accidents.
Identifiers: *CHRIS (Chemical Hazards Response Information System), *Hazardous materials, *Information systems, *Water pollution abatement, Surveys, Hazardous materials transportation, Chemical hazards response information system.

The appendix to the Final Report on the Preliminary System Development of a Chemical Hazards Response Information System (CHRIS) contains the results of studies that led to the development of the CHRIS concept. The results of a survey of user needs and the formulation and analysis of potential information system concepts are presented. A concept calling for the design of five reference guides (manuals) that will form the basic structure of CHRIS is developed. Other supporting information includes reviews of statistics on water pollution incidents, decision processes involved in spill response, other hazardous chemical information systems and successes and failures of information retrieval systems. A bibliography is also included. (Author)

AD-757 515 PC$3.00/MF$0.95
Air Force Weapons Lab Kirtland AFB N Mex
AN EVALUATION OF DIMENSIONAL ANALYSIS AND MODELING TECHNIQUES FOR AIR FORCE CIVIL ENGINEERING RESEARCH.
Technical rept. 15 May-15 Oct 71,
James F. Kanipe. Mar 73, 78p Rept no. AFWL-TR-72-179

Descriptors: (*Air force research, Civil engineering), Models (Simulations), Shelters, Blast, Cratering, Penetration, Structural properties, Pavements, Tires, Tests, Simulation.

Identifiers: Dynamic structural analysis, *Modeling techniques.

The application of modeling techniques to Air Force civil engineering research is investigated. The use of models is discussed in general terms, and model theory and dimensional analysis are reviewed. Examples of the use of modeling are presented, along with an extensive reference list. Dynamic modeling is difficult because usually not all dynamic model laws can be simultaneously satisfied. Nevertheless, in many cases the application of distorted model techniques can be applied to given reliable results. The conclusion is reached that many problems of the Civil Engineering Research Division of the Air Force Weapons Laboratory can be solved economically through the use of dimensional analysis and scale modeling. (Author)

AD-757 590 Not available NTIS
Hawaii Univ Honolulu
PROCEEDINGS OF THE HAWAII INTERNATIONAL CONFERENCE ON SYSTEM SCIENCES (6TH) HELD IN HONOLULU, HAWAII, 9-11 JAN 73. URBAN AND REGIONAL SYSTEMS: MODELING, ANALYSIS AND DECISION MAKING,
Art Lew. 1973, 242p AROD-11350:2-RT
Sponsored in part by Army Research Office, Durham. Supplement to AD-757 566.
Availability: Paper copy available from Western Periodicals Co., 13,000 Raymer St., N. Hollywood, Calif. 91605. Price not available.

Descriptors: (*Public health, Systems engineering), (*Urban planning, Decision making), (*Economics, Mathematical models), Programming (Computers), Water supplies, Transportation, Statistical analysis, Costs, Environment, Sociometrics, Data processing systems, Symposia.
Identifiers: *Medical services, *Health delivery systems, Computerized simulation, Economic models.

Contents:
- Can modeling be used to solve urban problems;
- Decision aids in health care;
- Applications of aerospace systems engineering methodology;
- Models of the urban economy;
- Quantitative models and the determination of environmental impacts;
- Health care systems;
- Demographic-economic modeling;
- Integrating disciplines;
- Environmental modeling;
- State and regional modeling;
- New directions in modeling analysis and decision making for the criminal justice system;
- Environmental information systems;
- Large scale urban systems analysis;
- Traffic modeling and control theory;
- Assessment workshop;
- Computer applications in urban systems;
- Econometric methodology in regional and urban modeling;
- World models - status, prospects, limitations;
- Transportation and land use;
- Socio-economic modelling;
- Values, Social modeling, and analysis;
- Regional information systems, transportation modeling, and development.

AD-757 594 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
MATHEMATICAL SIMULATION OF THE TURBIDITY STRUCTURE WITHIN AN IMPOUNDMENT; HYDRAULIC LABORATORY INVESTIGATION.
Final rept. Jun-Sep 72
Darrell G. Fontane, Joseph P. Bohan, and John L. Grace, Jr. Mar 73, 30p Rept no. AEWES-RR-H-73-2

Descriptors: (*Dams, Mathematical models), Hydraulic models, Simulation, Programming (Computers), Drainage, Tables.
Identifiers: Hills Creek reservoir, *Turbidity, Computerized simulation, Reservoirs, WESTEX computer program.

The turbidity structure of an impoundment was simulated using a mathematical model capable of simulating physical and chemical characteristics of an impoundment. Turbidity was handled as a conservative chemical substance. The model was used to predict the thermal and turbidity structures of an existing impoundment and was verified with observed data. The model was then used to predict the turbidity structure of a proposed impoundment.

AD-757 595 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
SELECTIVE WITHDRAWAL FROM MAN-MADE LAKES: HYDRAULIC LABORATORY INVESTIGATION.
Technical rept. Jul 66-Mar 73,
Joseph P. Bohan, and John L. Grace, Jr. Mar 73, 64p Rept no. AEWES-TR-H-73-4

Descriptors: (*Dams, Drainage), (*Water supplies, *Lakes), Fluid flow, Temperature, Salinity, Dyes, Velocity, Transport properties, Orifices, Density, Hydraulic models, Flow fields.
Identifiers: Water quality.

Laboratory investigations were conducted at the U. S. Army Engineer Waterways Experiment Station to determine the withdrawal-zone characteristics created in a randomly density-stratified impoundment by releasing flow through a submerged orifice, over a free and submerged weir, or through a combination of the above. Density stratification was generated in the experimental facilities by creating differentials in both temperature and salinity. Velocity profiles were obtained from movies of dye streak displacements. Through the investigations, generalized relationships for describing the vertical limits of the withdrawal zone and the vertical velocity distribution within the zone have been developed. Techniques for handling conditions in which the water surface or bottom boundary controlled the limits of the withdrawal zone and for describing the composite velocity profile resulting from withdrawal zones which overlapped have also been developed. (Author Modified Abstract)

AD-757 596 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
OUTLET WORKS, WARM SPRINGS DAM, DRY CREEK, RUSSIAN RIVER BASIN, SONOMA COUNTY, CALIFORNIA: HYDRAULIC MODEL INVESTIGATION.
Technical rept. Mar 71-Feb 72,
Jackson H. Ables, Jr., and Glenn A. Pickering. Feb 73, 50p Rept no. AEWES-TR-H-73-3

Descriptors: (*Dams, *Hydraulic models), Performance (Engineering), Fluid flow, Design, Construction materials, Drainage, Pipes, Fishes, Efficiency, California.
Identifiers: Warm Springs Dam, Outlet works, Stilling basins.

Tests were conducted on a 1:25-scale model of the outlet works for Warm Springs Dam to determine stilling basin performance and flow conditions in the outlet channel. Uncertainties existed as to the performance of the stilling basin, designed for full pipe flow, with the conduit flowing partially full since the curvature in the conduit could result in unequal distribution of flow at the outlet portal. The model reproduced the control structure, the entire length of the downstream conduit, the energy dissipator with fish channel, exit channel, and a portion of Dry Creek. (Author Modified Abstract)

AD-757 597 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
DEMOLITION OF FT. MEADE DAM, STURGIS, SOUTH DAKOTA, JUNE 1972,
Bruce B. Redpath. Jan 73, 17p Rept no. AEWES-Misc-Paper-E-73-1

Descriptors: (*Dams, Demolition), Detonations, Explosive materials, Concrete, Walls, Floods.
Identifiers: Sturgis (South Dakota), Ft. Meade Dam.

A portion of a flood-weakened concrete and masonry dam was deliberately demolished by explosives in June 1972 near Rapid City, South Dakota. The demolition was carried out to forestall the possibility of the dam's collapse in the event of renewed flooding during the period of devastating floods in Rapid City. An 80- by 25-foot segment on the left abutment was cleanly removed by 3000 pounds of explosives. The portion to be removed was outlined by explosively-loaded 2-inch diameter holes on 1-foot centers, the reinforced concrete panels were broken up by seven 150-pound surface charges, and the broken material was ejected by a 1700-pound cratering charge emplaced in a cavity in the dam. All explosives were detonated simultaneously. (Author)

AD-757 598 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
NAVIGATION CONDITIONS AT CONFLUENCE OF ARKANSAS, VERDIGRIS, AND GRAND RIVERS: HYDRAULIC MODEL INVESTIGATION.
Technical rept. Mar 67-Nov 69,
John J. Franco, and Cody D. McKellar, Jr. Mar 73, 84p Rept no. AEWES-TR-H-73-2

Descriptors: (*Inland waterways, *Hydraulic models), River currents, Structures, Erosion, Maintenance, Fluid flow, Navigation, Harbors, Oklahoma.
Identifiers: Arkansas River, Verdigris River, Muskogee Harbor, Dredging, Webber Falls Lock and Dam pool.

The investigation was concerned with the development of an adequate navigation channel through the reach of the Arkansas River from the mouth of the Verdigris River downstream to below the new U.S. Highway 62 Bridge, as part of the Arkansas River multipurpose project. A movable-bed model reproducing about 5.7 miles of the Arkansas River in the Webbers Falls Lock and Dam pool, including the lower reaches of the Verdigris and Grand Rivers, to scales of 1:80 vertical and 1:120 horizontal was used for the study. The purpose of the study was to develop a system of training structures that would reduce or eliminate shoaling at the confluence of the Verdigris and Arkansas Rivers, develop a channel through the navigation span of the new U.S. Highway 62 Bridge, and reduce the need for maintenance dredging in the Muskogee Harbor area, without producing currents that would be troublesome for navigation. (Author Modified Abstract)

AD-757 599 PC$5.45/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
DISPOSAL OF DREDGE SPOIL: PROBLEM IDENTIFICATION AND ASSESSMENT AND RESEARCH PROGRAM DEVELOPMENT.
Final rept. Jun 71-30 Apr 72,
M. B. Boyd, R. T. Saucier, J. W. Keeley, R. L. Montgomery, and R. D. Brown. Nov 72, 148p* Rept no. AEWES-TR-H-72-8

Descriptors: (*Soils, *Disposal), Swamps, Water pollution, Oceans, Physical properties, Chemical properties, Sampling, Estuaries, Seacoast, Inland waterways, Earth-handling equipment, Impact, Erosion, Ocean bottom, Marine biology, Beaches, Environment, Scientific research.

Identifiers: *Dredging, *Spoil, *Solid waste disposal, *Salt marshes, Criteria, Dikes, Land use, Planning, Leaching, Utilization, Wildlife, Water pollution effects (Animals), Water pollution effects (Plants).

The report presents an assessment of the dredge spoil disposal problem and outlines a research program designed to provide needed information concerning current and potential spoil disposal practices. The report format is intended to reflect the two basic objectives of the report. Section A is directed toward management level review and presents (a) pertinent background information concerning the dredge spoil disposal problem and the current study, (b) conclusions and recommendations resulting from the problem assessment phase of the study, and (c) an outline of the recommended research program. Section B provides an objective assessment of the nationwide problem in sufficient detail to permit meaningful technical review by other interested personnel within and outside the Corps. Section C has been included to show a total-problem organizational structure which is being used to guide the development of the detailed research plan.

AD-757 603 PC$3.00/MF$0.95
Army Medical Environmental Engineering Research Unit Edgewood Arsenal Md
PROBLEM DEFINITION STUDY: EVALUATION OF HEALTH AND HYGIENE EFFECTS OF THE DISPOSAL OF PESTICIDES AND PESTICIDE CONTAINERS,
Thomas A. Miller. Aug 72, 49p Rept no. USAMEERU-73-01

Descriptors: (*Pesticides, Disposal), (*Army, Pest control), Decontamination, Insecticides, Herbicides, Sanitary engineering, Public health, Combustion, Decomposition.
Identifiers: *Waste disposal, *Liquid waste disposal, Earth fills, Biodeterioration.

The disposal of Department of the Army (DA) surplus pesticides of all types presents serious problems. The report describes a study to determine if adequate, environmentally-sound methods for disposal exist. Significant among the various types of pesticides are large quantities of organochlorine insecticides and phenoxy acid herbicides. Thermal degradation or ground deposition are the disposal methods with the greatest potential for handling large quantities of material in these categories. Chemical treatment has disposal for decontamination of empty pesticide containers. Recommendations are made concerning research to determine the best methods of disposal. (Author Modified Abstract)

ANL/ES-19 PC$3.00/MF$0.95
Argonne National Lab., Ill.
EPISODE CONTROL STRATEGY FOR MOTOR VEHICLES.
A. D. Rossin. Oct 72, 76p
Contract W-31-109-ENG-38

Descriptors: *Vehicles, *Air pollution episodes.

For abstract, see NSA 27 06, number 14345.

COM-73-10395 PC$3.00/MF$0.95
National Marine Fisheries Service, Beaufort, N.C. Atlantic Estuarine Fisheries Center.
EXPANSION AND EVALUATION OF AN ARTIFICIAL REEF OFF MURRELL'S INLET, SOUTH CAROLINA.
Final rept.,
Richard B. Stone, Chester C. Buchanan, and Richard O. Parker, Jr. Feb 73, 59p CPRC-72009
Contract CPRC-10140032

Descriptors: (*Reefs, Construction), (*Recreation, South Carolina), Fishing grounds.
Identifiers: *Paradise Artificial Reef, Murrells Inlet, *Artificial reefs.

The report describes a project to improve sport fishing out of Murrell's Inlet by establishing well marked artificial reefs close to the inlet, expansion of the Paradise Artificial Reef, and research on the effect of this reef on the marine environment, the sport fishery off Murrell's Inlet, and the economy of the area. (Author)

COM-73-10408 PC$3.00/MF$0.95
Michigan Univ., Ann Arbor. Sea Grant Program.
APPLICATIONS OF LINEAR INTEGER PROGRAMMING TO PROBLEMS OF LAND USE ALLOCATION.
Sea Grant technical rept.,
R. L. Patterson. Jun 72, 41p MICHU-SG-72-213, TR-31 NOAA-73022001
Report on Multidisciplinary Research in the Great Lakes.

Descriptors: (*Land use, Allocation models), (*Linear programming, Land use), Constraints, Decision making, Mathematical models, Matrices (Mathematics), Water resources, Transportation, Optimization.
Identifiers: Integer programming, Sea Grant program, Goal programming, Resource allocation.

Linear integration programming is applied to problems of land use allocations in the report. Discussions deal with the following aspects: constrained optimization and land use; a simplified land use assignment problem; a multiple land use assignment problem; difficulties in formulating linear objective functions; difficulties in specifying cell sizes; a modified site assignment problem; applications of mixed integer programming; and goals programming. (Author)

EIS-AA-73-0391-D PC$14.25
Interstate Commerce Commission, Washington, D.C.
EX PARTE NO. 281. INCREASED FREIGHT RATES AND CHARGES, 1972 (ENVIRONMENTAL MATTERS).
Draft environmental impact statement.
13 Mar 73, 242p ELR-0391

Descriptors: (*Environmental impact statements, Cargo transportation), (*Cargo transportation, Rates (Costs)), Rail transportation, Public relations, Expense.
Identifiers: *Freight rate increases.

Authorization is sought for increases in railroad rates and charges on commodities moving for purposes of recycling. The increases authorized are considered not to have a significant effect upon the quality of the human environment.

EIS-AA-73-0405-F PC$8.00/MF$0.95
Forest Service, Portland, Oreg. Pacific Northwest Region.
THE FALCON PROGRAM.
Final environmental impact statement.
7 Mar 73, 116p ELR-0405, USDA-FS-FES (Adm)-73-12
Supersedes report dated 10 Aug 72, EIS-AA-72-5103-D.

Descriptors: (*Environmental impact statements, *Forestry), (*Aerial surveys, Environmental impact statements), Methodology, Balloons, Helicopters, Cables (Ropes), Reforestation, Harvesting, Availability, Noise (Sound), Water quality, Wood products, United States.
Identifiers: Falcon project, *Aerial logging, Forestry advanced logging and conservation.

FALCON is a proposal for a research and development program for advanced logging systems. Emphasis will be on new or improved aerial logging methods such as balloons, helicopters, and cable systems, singly or in combination, with the aim of providing a larger array of timber harvesting alternatives in environmentally sensitive areas. It would be applicable in all forested areas of the United States and eventually to world forestry. The FALCON program itself will have minimal environmental effects. There would be some noise, reforestation changes, forest residue treatments, and changes in accessibility.

EIS-AA-73-0477-F-1 PC$3.00/MF$0.95
Bureau of Alcohol, Tobacco and Firearms, Washington, D.C.
POLYVINYL CHLORIDE LIQUOR BOTTLES.
Final environmental impact statement,
Rex D. Davis. 9 Mar 73, 239p* ELR-0477-F-1
Supersedes report dated 14 Feb 72, PB-206 561-D.
See also EIS-AA-73-0477-F-2.

Descriptors: (*Environmental impact statements, Polyvinyl chloride), (*Bottles, *Polyvinyl chloride), (*Waste disposal, Polyvinyl chloride), Beverages, Earth fills, Composts, Incinerators, Air pollution, Refuse.
Identifiers: *Liquor bottles, *Solid waste disposal, Sanitary landfills, Litter, Pyrolysis incineration, Beverage containers.

The report concerns the impact from approving the use of polyvinyl chloride plastic (PVC) for the manufacture of liquor bottles. The main impact evaluated was the waste disposal problem. It was found that the beneficial effects of the PVC liquor bottle will be in the form of a lighter and safer consumer package which will reduce the volume of the solid wasteload. Unfortunately, the burning characteristics of PVC have detrimental effects in the incineration of solid wastes. However, on the basis of a review of independent and governmental studies on the incineration of PVC, it has been determined that the change in the refuse characteristics and plastics composition resulting from conversion to PVC liquor bottles is too small to cause significant increases in incinerator corrosion or air pollution problems.

EIS-AA-73-0477-F-2 PC$3.00/MF$0.95
Bureau of Alcohol, Tobacco and Firearms, Washington, D.C.
ASSESSMENT OF POLYVINYL CHLORIDE AS A PACKAGING MATERIAL FOR DISTILLED SPIRITS.
Final environmental impact statement,
Richard C. Bailie, Boyd T. Riley, Jr., and Raul Zaltzman. 17 Jan 73, 296p* ELR-0477-F-2
Supersedes report dated 14 Feb 72, PB-206 561-D.
See also EIS-AA-73-0477-F-1.

Descriptors: (*Environmental impact statements, Polyvinyl chloride), (*Bottles, *Polyvinyl chloride), (*Waste disposal, Polyvinyl chloride), Beverages, Manufacturing, Raw materials, Energy, Air pollution, Water pollution, Refuse, Reclamation, Utilization, Fire hazards, Substitutes, Incinerators, Earth fills, Composts, Evaluation, Acceptability.
Identifiers: *Liquor bottles, *Solid waste disposal, Litter, Pyrolysis incineration, Sanitary landfills, Waste recycling, Beverage containers.

The analysis is confined to the evaluation of the insults to our environment from using either polyvinyl chloride (PVC) or glass as a liquor container. The authors presents three discussions. The first is to provide a total assessment of the environmental costs or inventory for the use of PVC containers for distilled spirits. The second is to provide additional information on certain key questions that were developed as a result of the past efforts of the Bureau of Alcohol Tax and Firearms. The third represents a brief questionnaire that attempts to explore the opinions and attitudes of the various groups that might have interest in a particular question at hand.

EIS-AK-73-0393-D PC$3.00
Federal Aviation Administration, Washington, D.C. Airports Service.

THE CONSTRUCTION OF A NEW AIRPORT AT KASIGLUK, ALASKA.
Draft environmental impact statement.
20 Feb 73, 13p ELR-0393

Descriptors: (*Environmental impact statements, *Airports), (*Alaska, Environmental impact statements), Construction, Aprons, Taxiways, Gravel, Economic factors.
Identifiers: *Kasigluke (Alaska).

The proposed project will involve the construction of a landing strip, a parking apron, and the connecting taxiway. The landing strip will be 100' x 2,500', the apron 160' x 125', and the taxiway 175' x 50'. The construction will take place approximately 1-1/2 miles south of Kasigluk, Alaska. (Figure 1). The fill material is to be taken from a sandy ridge on the edge of an almost-dry lake bed located at the south end of the landing strip. The material, a good silty sand, will be spread over the existing vegetation to a specified thickness and then a surface course of gravel, barged in from an existing pit area near the Kuskokwim River, will be placed as the final lift. A safe, usable airport will be present at the termination of the project. No significant adverse effects on the natural or human environments are anticipated as a result of this project. The beneficial aspects of the project were established in Section 1-c of this statement. No person will be displaced by this project.

EIS-AK-73-0438-D PC$5.00
Corps of Engineers, Anchorage, Alaska.
OPERATION AND MAINTENANCE OF THE NINILCHIK SMALL BOAT HARBOR, NINILCHIK, ALASKA.
Draft environmental impact statement.
Feb 73, 58p ELR-0438

Descriptors: (*Environmental impact statements, *Dredging), (*Alaska, Environmental impact statements), Harbors, Maintenance, Channel improvements, Erosion control, Beach erosion, Marine biology, Ecology.
Identifiers: *Ninilchik (Alaska), Ninilchik small boat harbor.

The Ninilchik Small Boat Harbor is an existing Corps of Engineers project constructed in 1961. Annual maintenance requirements include dredging of the boat basin, emergency dredging of the entrance channel and repair of the beach erosion protection. The environmental impacts resulting from the operation and maintenance of the project are associated with marine biota, water quality, beach morphology, and human ecology. Presently identifiable adverse effects are: removal of water-land interface, temporary increase in water turbidity, burial of land-air interface at beach disposal site, and disruption of littoral currents.

EIS-AK-73-0453-D PC$30.75
Federal Highway Administration, Juneau, Alaska. Alaska Div.
PROJECT S-0851, COPPER RIVER HIGHWAY, MILEPOST 39, TO MILEPOST 116, SOUTHCENTRAL DISTRICT, ALASKA.
Draft environmental impact statement.
Mar 73, 573p ELR-0453
Prepared in cooperation with Alaska State Dept. of Highways.

Descriptors: (*Environmental impact statements, *Highways), (*Alaska, Environmental impact statements), Construction, Rural areas, Traffic engineering, Economic development, Recreational facilities.
Identifiers: Copper River Highway, *Cordova (Alaska).

The proposed project covers the construction and reconstruction of the seventy-seven mile section Copper River Highway from Mile 39 to 116. This highway will be a major arterial connecting the City of Cordova with the Richardson Highway. The highway when completed will have little physical effect on the area it traverses. The lush coastal area thru which it passes will revegetate quickly to the actual road limits. Displacement of wildlife will be minimal and the effect on the fishery will for all intents and purposes be negligible. Land use of adjacent areas will remain exactly as they are. The highway will serve as one of the outstanding scenic highways in the state and hence the entire U.S. The impact that will result from millions of people who will travel the highway over its life span can not be evaluated in dollar and cents, but only in relation to other impacts. In this respect it is by far the dominant impact of completion of this highway will have. The City of Cordova will experience changes in its economy, culture, and life style.

EIS-AK-73-0509-D PC$5.75
National Park Service, Seattle, Wash. Pacific Northwest Region.
PROPOSED GLACIER BAY WILDERNESS, GLACIER BAY NATIONAL MONUMENT.
Draft environmental impact statement.
Mar 73, 75p ELR-0509, DES-73-16

Descriptors: (*Environmental impact statements, *National Parks), (*Alaska, Environmental impact statements), Regulations, Traffic, Mining, Mountains, Fjords, Glaciers.
Identifiers: *Glacier Bay National Monument, Wilderness areas.

The National Park Service proposes to establish 2,052,700 acres as wilderness in Glacier Bay National Monument. The area contains rugged mountains; enormous complex glaciers; ice-sculptured fjords; and large areas of vegetation, displaying the entire spectrum of successional stages from mosses and lichens to a hemlock climax. Occasional earthquakes, post-glacial uplifting, retreating and advancing glaciers combine with the weather, topography and surrounding sea to produce a unique area. Designation of 73% of this area as wilderness would maintain the present pristine condition of the area by excluding roads, by modifying mining activity, and removing commercial fishing, power boating, aircraft landings, and motorized access within the wilderness portion. Access by steamship, motor boat, commercial fishing and aircraft landings will continue on Glacier Bay. Restrictions on development of backcountry facilities might limit use of the area and would curtail certain types of research projects. Mineral lands legally located and maintained as active mining claims are proposed as potential wilderness additions.

EIS-AL-73-0498-F PC$4.50/MF$0.95
Federal Highway Administration, Montgomery, Ala. Alabama Div.
PROJECT S-28-E AND F-349 (2), COOSA AND TALLAPOOSA COUNTY, US-280, SOCAPATOY TO EAST OF ALEXANDER CITY, ALABAMA.
Final environmental impact statement.
Mar 73, 50p FHWA-ALA-EIS-72-06-F ELR-0498
Supersedes report dated 1972, EIS-AL-72-4716-D.

Descriptors: (*Environmental impact statements, *Highways), (*Alabama, Environmental impact statements), Land acquisition, Eminent domain, Traffic safety.
Identifiers: Alexander City (Alabama), Coosa County (Alabama), Tallapossa County (Alabama), US highway 280, Socapatoy (Alabama).

The project in Coosa and Tallapoosa Counties, Alabama, is the proposed improvement of Highway US-280, from the junction of Alabama state route 9 and US-280 at Socapatoy to the existing section of US-280 east of Alexander City. The total length is approximately 12 miles. Additional right of way will be required. Environmental impact includes the acquisition of approximately 210 acres of rural undeveloped and urban developed land along with the displacement of nineteen owner and four tenant families, and four owner and twelve tenant businesses, and the enhancement of transportation quality and highway safety.

EIS-AL-73-0542-F PC$12.00/MF$0.95
Army Engineer District, Mobile, Ala.
PERMIT APPLICATION BY RADCLIFF MATERIALS, INC. DREDGING OF DEAD--REEF SHELLS, MOBILE BAY, ALABAMA.
Final environmental impact statement.
Feb 73, 198p ELR-0542

Descriptors: (*Environmental impact statements, *Dredging), (*Alabama, Environmental impact statements), Shellfish, Oysters, Bays, Reefs, Estuaries, Water quality.
Identifiers: *Mobile Bay.

Description of action: Issuance of Section 10 Permit for the dredging of dead-reef shells in Mobile Bay as requested by Radcliff Materials, Inc. Environmental impacts: Annual removal of approximately 1.8 million cubic yards of dead-reef shell, approximately 4 million cubic yards of overburden, and continued economic growth of the Mobile area. Adverse environmental effects: Lowered productivity on a continuing basis of about 2,000 acres of Mobile Bay; temporary minor damage to flora and fauna in up to 3,500 acres of the estuary; degradation of water quality and aesthetics; conflict with commercial fishing interests; long-term softening of the bottom of Mobile Bay; and excessive sound levels reaching shore areas.

EIS-AR-73-0449-D PC$8.75
Army Engineer District, New Orleans, La.
RED RIVER BELOW DENISON DAM, MCKINNEY BAYOU, ARKANSAS, AND TEXAS.
Draft environmental impact statement.
Jan 73, 134p ELR-0449
See also report dated Jan 73, EIS-AR-73-0450-D.

Descriptors: (*Environmental impact statements, *Flood control), (*Arkansas, Environmental impact statements), Channel improvements, Drainage, Land use, Agriculture, Spoils, Forest land, Water resources, Wildlife.
Identifiers: *Miller County (Arkansas), *Bowie County (Texas).

The project proposes construction of two major outlet channels to Red River with related control works, channel enlargement of 15.6 miles of McKinney Bayou, and interior drainage improvements. The proposed project is located in Miller County, Arkansas and Bowie County, Texas. The proposed project will provide flood protection and/or improved drainage to about 41,600 acres of cleared land. Some 3,600 acres of woodland will be converted to agricultural use as a result of project construction. Implementation of the project features will necessitate the removal and disposal of approximately 3 million cubic yards of material which will produce aesthetical losses to areas. Major adverse impacts will result from the clearing of 3,600 acres of alluvial bottom forest for agricultural production. These impacts include losses associated with the forest, fish, and water resources, and/or the aesthetical values contained therein. Huntable wildlife resources will be reduced by 870 man-days hunting annually.

EIS-AR-73-0450-D PC$8.00
Army Engineer District, New Orleans, La.
RED RIVER BELOW DENISON DAM, DAYS CREEK, ARKANSAS AND TEXAS.
Draft environmental impact statement.
Jan 73, 119p ELR-0450
See also report dated Jan 73, EIS-AR-73-0449-D.

Descriptors: (*Environmental impact statements, *Flood control), (*Arkansas, Environmental impact statements), Channel improvements, Dredging, Spoils, Rights of way acquisition.
Identifiers: *Bowie County (Texas), *Miller County (Arkansas).

Modification to about 18.74 miles of water bottoms and banks of Days Creek, Nix Creek, Swampoodle Creek, Wagner Creek, and Cowhorn Creek to reduce flood stages and related damages to urban and rural developments situated near these streams. Construction requires the removal and disposal of 2.8 million cubic yards of spoil and placement of 13.00 miles of concrete channel and 0.08 mile of riprap. The project area is located in Bowie County, Texas, and Miller County, Arkansas, within the city of Texarkana, Arkansas-Texas. The proposed physical alterations of the above-named streams will provide flood protection for about 2,900 acres of flood plain lands and their existing improvements. It will also enhance the intensive development and utilization of about 1,320 acres of additional lands for urban or industrial uses. The adverse environmental impacts associated with the proposed action are considered minimal.

EIS-AR-73-0484-D PC$4.25
Federal Aviation Administration, Washington, D.C. Airports Service.
PROPOSED IMPROVEMENTS, OZARK--FRANKLIN COUNTY AIRPORT, CITY OF OZARK, FRANKLIN COUNTY, ARKANSAS.
Draft environmental impact statement.
Mar 73, 43p ELR-0484
Prepared in cooperation with Fort Worth Airports District Office, Tex.

Descriptors: (*Environmental impact statements, *Airports), (*Arkansas, Environmental impact statements), Improvement, Right of way acquisition, Runways, Aviation lighting.
Identifiers: *Ozark-Franklin County Airport, Franklin County (Arkansas).

It is proposed to acquire land for airport development and clear zone easements (approximately 30 acres - fee title; 16 acres - easement); construct 3300' by 60' (NE-SW) paved asphaltic concrete runway; construct 170' x 400' paved asphaltic concrete aircraft parking apron; install medium intensity runway lights; install visual approach slope indicator (VASI), rotating beacon, segmented circle with 8' lighted wind cone; construct 1500' by 16' access road; construct barbed wire fence. The proposed project does not involve the displacement and relocation of persons residing on land needed for the development. No increases in the present low level of noise or air pollution are anticipated as the proposed improvements are to more safely and efficiently accommodate those types and numbers of general aviation aircraft currently using the airport.

EIS-AZ-73-0415-F PC$7.75/MF$0.95
Army Engineer District, Los Angeles, Calif.
GILA RIVER CHANNEL IMPROVEMENTS BETWEEN CAMELSBACK RESERVOIR SITE AND SALT RIVER, ARIZ. (UPPER END OF SAFFORD VALLEY BETWEEN THE BROWN CANAL HEADING AND THE SAN CARLOS INDIAN RESERVATION, GRAHAM COUNTY, ARIZONA).
Final environmental impact statement.
Mar 73, 115p ELR-0415
Revision of report dated 1 Nov 71.

Descriptors: (*Environmental impact statements, *Channel improvements), (*Arizona, Environmental impact statements), Valleys, Phreatophytes, Removal, Flood control, Water conservation, Wildlife.
Identifiers: Safford Valley, Gila River, Graham County (Arizona).

It is proposed to continue clearing work, halted by court injunction, along 54 miles of the Gila River in Graham County, Arizona. Work consists of removing phreatophytes (mostly saltcedar) from 3,050 acres. Clearing would be limited to a constant width of 600 feet and where necessary a minimum width of 200 feet. Developed areas in Safford Valley would be protected against floods up to 16,000 c.f.s., damages from larger floods would be reduced, and water previously lost by transpiration of phreatophytes would be salvaged. Loss of wildlife habitat would in turn cause decrease in wildlife utilizing riverbed year-round, as a migratory stopover, and for seasonal nesting.

EIS-CA-73-0421-D PC$4.50
Facilities Engineering and Construction Agency, San Francisco, Calif. Region IX.
SOCIAL SECURITY PAYMENT CENTER, SAN FRANCISCO, BAY AREA, CALIFORNIA.
Draft environmental impact statement.
9 Mar 73, 49p ELR-0421

Descriptors: (*Environmental impact statements, *Public buildings), (*California, Environmental impact statements), Construction, Public health, Social welfare, Centers, Urban renewal, Benefit cost analysis.
Identifiers: *Richmond (California), San Francisco Bay area.

The proposed action consists of construction of a new building to house the Department of Health, Education and Welfare, Social Security Administration Payment Center for the San Francisco Bay Area. The facility will include approximately 554,900 gross square feet of general office and special purpose space, and will be 6 stories above grade. The site is located in an urban renewal area in Richmond, California. Socio-economic effects will accrue to the immediate area of the proposed project and the San Francisco Bay area, and service to the public is expected to be improved through centralized operations and location.

EIS-CA-73-0510-D PC$7.50
Department of Housing and Urban Development, San Francisco, Calif. San Francisco Area Office.
CITY CENTER PROJECT, OAKLAND, CALIFORNIA, PROJECT NO. 'ALIF. R-122.
Draft environmental impact statement. Mar 73, Mar 73, 109p HUD-R09-EIS-73-4D ELR-0510

Descriptors: (*Environmental impact statements, *Urban renewal), (*California, Environmental impact statements), Improvement, Central city, Project planning, Socioeconomic status, Urban relocation, Residential buildings, Centers, Expansion, Commercial buildings, Parking facilities, Access roads, Circulation, Blighted areas, Design standards.
Identifiers: *Oakland (California), *Housing and urban development.

The proposed project will upgrade a rapidly deteriorating central business core by improving structural and infrastructural conditions. Other effects include increase in traffic and noise levels.

EIS-CO-73-0401-D PC$9.25
Federal Highway Administration, Denver, Colo. Colorado Div.
SOUTH KIPLING STREET FROM S. H. 26 (WEST ALAMEDA AVENUE), TO S.H. 285 (WEST HAMPDEN AVENUE), CITY OF LAKEWOOD, JEFFERSON COUNTY, COLORADO.
Draft environmental impact statement.
Mar 73, 141p FHWA-CO-EIS-73-02-D ELR-0401
Prepared in cooperation with Colorado State Div. of Highways.

Descriptors: (*Environmental impact statements, *Highways), (*Colorado, Environmental impact statements), Construction, Central city, Interchanges, Land use, Commerce.
Identifiers: Lakewood (Colorado), Jefferson County (Colorado).

The project proposes design and construction of a 4.3 mile segment of South Kipling Street to connect the U.S. 6-Kipling Interchange. The construction of this segment of South Kipling Street will affect the residential and small commercial development now existing, the economic activity in the area, land use, environment, ecology, and esthetics of the immediate area along the route, more as a part of long range planning than as an undesirable encroachment. There are four alternatives considered.

EIS-CO-73-0417-F PC$10.75/MF$0.95
Atomic Energy Commission, Washington, D.C.
RIO BLANCO GAS STIMULATION PROJECT. RIO BLANCO COUNTY, COLORADO.
Final environmental impact statement.
Mar 73, 175p ELR-0417, WASH-1519-Addendum
Supplement to Final environmental impact statement dated 27 Apr 72, PB-205 782-F.

Descriptors: (*Environmental impact statements, Reservoir engineering), (*Colorado, Environmental impact statements), (*Petroleum industry, Colorado), Nuclear explosions, Underground explosions, Natural gas, Gas production, Radioactive contaminants, Explosion effects, Stimulation.
Identifiers: Rio Blanco County (Colorado).

The report describes an experimental project involving the simultaneous detonation of three, thirty-kiloton nuclear explosives, 5,000 to 7,000 feet below the surface in a natural-gas-bearing geologic formation underlying a site 27 miles from Meeker, in Rio Blanco County, Colorado. The purpose of the project is to gather data on the feasibility of using nuclear explosions to stimulate natural gas production from low-permeability reservoirs. The adverse environmental effects include: ground motion from the detonation of the nuclear explosions and resultant architectural damage to nearby structures; planned release of radioactivity to the atmosphere during production testing of the natural gas and the possible resultant low-level exposures to some local residents; and entrapment in the natural-gas formation of radioactive materials at or near the points at which the nuclear explosives are detonated, with no resultant interaction with the biosphere. The potential environmental impact of the proposed project has not been significantly altered.

EIS-CO-73-0515-F PC$12.00/MF$0.95
Rural Electrification Administration, Washington, D.C.
BLUE MESA TO LAKE CITY, COLORADO, TRANSMISSION LINE 115 KV.
Final environmental impact statement.
Mar 73, 200p USDA-REA-ES (Adm)-72-12
ELR-0515
Supersedes report dated 23 May 72, EIS-CO-72-4525-D.

Descriptors: (*Environmental impact statements, *Power transmission lines), (*Colorado, Environmental impact statements), Landscaping, Esthetics, Construction, Substations.
Identifiers: *Gunnison County (Colorado), *Hinsdale County (Colorado).

Construction is proposed of approximately thirty-three miles of 115 kV transmission line between Blue Mesa and Lake City, Colorado. The project also includes a new substation at Lake City and the addition of one bay at the existing USBR substation at Blue Mesa. Counties affected are Gunnison and Hinsdale. The major adverse environmental impact will be the intrusion of the transmission line upon the landscape. Every reasonable effort will be made to minimize the negative visual environmental aspects of this project. The additional exposure to erosion during construction will be minimized by judicious scheduling of the construction and establishing an effective revegetation program.

EIS-CT-73-0472-F PC$9.25/MF$0.95
Federal Highway Administration, Hartford, Conn. Connecticut Div.
RECONSTRUCTION OF 2.5 MILES OF ROUTE 84 IN THE TOWNS OF NEWTOWN AND SOUTHBURY, CONNECTICUT.
Final environmental impact statement.

Mar 73, 144p FHWA-CONN-EIS-71-07-F
ELR-0472
Supersedes report dated 7 Jul 71, PB-200 804-D.
Prepared in cooperation with Connecticut State Dept. of Transportation.

Descriptors: (*Environmental impact statements, *Highways), (*Connecticut, Environmental impact statements), Improvement, Construction, Interstate transportation, Right of way acquisition, Eminent domain.
Identifiers: Newtown (Connecticut), Southbury (Connecticut), Interstate highway 84.

The statement is concerned with the reconstruction of an approximately 2.5-mile section of Route I-84 in the Towns of Newtown and Southbury, including the crossing of the Housatonic River. The project calls for the rebuilding of the present limited access, four-lane freeway to bring it up to Federal interstate standards to which other sections of this route immediately to the east and west are now built. The proposed improvement will provide a second bridge for the westbound lane and shift it northerly to provide a 100 foot median. The eastbound lane will be rebuilt on its present alignment except for a portion in Southbury where both lanes will be shifted northward to flatten the sharp curvature of the roadway at that point. The present direct access of local roads to I-84 on the Newtown side will be eliminated and the four ramps on the Southbury side rebuilt as one 'on' ramp westbound and one 'off' ramp eastbound. Probable impacts on the environment and adverse effects are discussed in the statement.

EIS-CT-73-0517-D PC$13.75
Directorate of Licensing (AEC), Washington, D.C.
HADDAM NECK (CONNECTICUT YANKEE) NUCLEAR POWER PLANT CONNECTICUT YANKEE ATOMIC POWER COMPANY, HARTFORD, CONNECTICUT, DOCKET NUMBER 50--213.
Draft environmental impact statement.
Mar 73, 232p ELR-0517

Descriptors: (*Environmental impact statements, *Nuclear power plants), (*Connecticut, Environmental impact statements), Licenses, Operations, Pressurized water reactors, Cooling water, Land use, Wildlife, Radiation hazards, Radiation effects.
Identifiers: Haddam Neck power reactor, Thermal pollution, Hartford (Connecticut).

The proposed action is the issuance of a full-term operating license for the Haddam Neck Nuclear Power Plant (commonly known as the Connecticut Yankee Atomic Power Plant). The site is on the east shore of the Connecticut River, about 22 miles south-southeast of Hartford and about 16 miles north of Long Island Sound. The reactor is a pressurized water reactor, the exhaust steam from the turbine is cooled by water pumped from the Connecticut River, then returned to the river by way of a 1.16 mile-long canal. A summary of environmental impacts is given.

EIS-DC-73-0532-D PC$6.00
National Capital Planning Commission, Washington, D. C.
PROPOSED MODIFICATIONS TO THE COMPREHENSIVE PLAN FOR THE NATIONAL CAPITAL TO CONFORM TO THE PROPOSED BOLLING/ANACOSTIA BASE DEVELOPMENT CONCEPT.
Draft environmental impact statement.
Mar 73, 77p ELR-0532

Descriptors: (*Environmental impact statements, *Urban planning), (*District of Columbia, Environmental impact statements), Military facilities, Laboratories, Residential buildings, Urban renewal, Centers, Parks, Urban relocation, Community development, Circulation.
Identifiers: Bolling Anacostia tract, Open space studies.

The proposed action is Commission adoption of the modifications to the Comprehensive Plan for the National Capital, which would conform the Comprehensive Plan to the Development Concept for the Bolling/Anacostia Tract proposed by the Department of Defense. The modifications would involve text and map changes in the residential, nonresidential, open space and circulation aspects of the Comprehensive Plan and provides information for three areas needing initial or additional discussion. These areas are: (1) The Linear/Riverfront Park; (2) Landmarks; and (3) Noise Impacts (not addressed in the Navy's Draft Statement).

EIS-DE-73-0493-F PC$3.00/MF$0.95
Army Engineer District, Philadelphia, Pa.
SMALL BEACH EROSION CONTROL PROJECT, LEWES, DELAWARE.
Final environmental impact statement.
Mar 73, 17p ELR-0493
Supersedes report dated Jul 72, EIS-DE-72-4917-D.

Descriptors: (*Environmental impact statements, *Beaches), (*Delaware, Environmental impact statements), Beach erosion, Erosion control, Earth fills, Shore protection, Dunes, Grasses, Dredging.
Identifiers: *Lewes (Delaware).

It is proposed to complete a study to determine the feasibility of restoring and stabilizing a portion of the shoreline of Lewes, Delaware, by providing beach erosion control measures that would result in a protective and recreational beach adequate to meet the present and future needs of the area. The proposed plan of improvement consists of beach fill, periodic nourishment, sand fence and dune grass. Initial fill and beach nourishment will be dredged from Roosevelt Inlet. It would be necessary to initially dredge 41,000 cubic yards of material from Roosevelt Inlet and every two years dredge 40,000 cubic yards of fill from that same source. The project will prevent storm damage, improve appearance of the beach, and satisfy recreational beach use demand. Disturbance of bottom sediments would cause a temporary increase in turbidity and bacterial counts in the overlying waters without significant effect on fishery resources.

EIS-FL-73-0407-F PC$6.75/MF$0.95
Federal Highway Administration, Tallahassee, Fla. Florida Div.
STATE PROJECT NO. 72040-1514, 72040-1701, FEDERAL PROJECT NO. T-4041 (8), STATE ROAD NO. 10A, DUVAL COUNTY, FLORIDA.
Final environmental impact statement.
Mar 73, 92p FHWA-FLA-EIS-72-18-F ELR-0407
Supersedes report dated 6 Jun 72, EIS-FL-72-4648-D. Prepared in cooperation with Florida State Dept. of Transportation.

Descriptors: (*Environmental impact statements, *Highways), (*Florida, Environmental impact statements), Construction, Land use, Residential buildings, Improvement, Commercial buildings, Access roads.
Identifiers: *Florida road 10A, Duval County (Florida).

The project consists of providing grade separations at Arlingwood Avenue and Townsend Boulevard at their intersections with State Road 10A (Arlington Expressway) in Jacksonville, Duval County, Florida. The environmental impacts of the proposed improvement are recognized as to their effects upon the residential subdivisions north of the expressway and limiting access to commercial enterprises adjacent to the expressway. Benefits generated include the improvements of a very unsafe intersection.

EIS-FL-73-0411-F PC$5.25
Federal Highway Administration, Tallahassee, Fla. Florida Div.
S.R. 50 FROM S. R. 33 IN GROVELAND TO S. R. 561, LAKE COUNTY, FLORIDA. PROJECT NO. 11070-1504, S.P.D.C. NO. 71-0069.
Final environmental impact statement.
Mar 73, 64p ELR-0411
Supersedes report dated Oct 72, EIS-FL-72-5406-D. Prepared in cooperation with Florida State Dept. of Transportation.

Descriptors: (*Environmental impact statements, *Roads), (*Florida, Environmental impact statements), Construction, Improvement, Water quality, Lakes, Engine noise.
Identifiers: Florida route 50, U.S. highway 27, *Lake County (Florida).

The proposed project involves the upgrading of an existing two lane highway facility between Groveland and Clermont in Lake County to a multi-lane highway capable of adequately accommodating existing and projected traffic along the corridor. The project is part of a general plan of improvement for State Route 50 through Lake County. The project is considered to have a potentially positive environmental impact on the immediate area as well as the states' arterial highway system by providing a more efficient area access and uncongested traffic flow through and between the communities served. Short term unavoidable adverse environmental effects include displacement of existing buildings, persons and businesses along the corridors considered and potential threat of deposit of objectionable materials into adjacent waters during the construction operations. Adjustment of alignment and section can be expected to substantially reduce the number of displacees estimated in the previous report.

EIS-FL-73-0437-D PC$7.00
Federal Highway Administration, Tallahassee, Fla. Florida Div.
FEDERAL AID PROJECTS NOS. F-024-2 (13), F--024-2 (14), RF-024-2 (12), IMPROVEMENT OF STATE ROAD 80 FROM STATE ROAD 700 TO I-95, PALM BEACH COUNTY, FLORIDA.
Draft environmental impact statement.
Mar 73, 96p FHWA-FLA-EIS-73-3-D ELR-0437
Prepared in cooperation with Florida State Dept. of Transportation.

Descriptors: (*Environmental impact statements, *Highways), (*Florida, Environmental impact statements), Improvement, Intersections, Rural areas, Urban areas, Eminent domain.
Identifiers: Palm Beach County (Florida), Florida route 80.

The proposed project is the improvement of State Road 80 between I-95 and State Road 700 in Palm Beach County, Florida. Widening to 4 lanes in rural areas and 6 lanes in urban areas is proposed with realignment in the vicinity of State Road 700 to intersect with the approved new alignment of State Road 80 between State Road 700 and Belle Glade. Environmental impacts include some displacement of residences and businesses. No conservation or natural environmental problems are foreseen. Air, noise and water pollution will not directly result from the project. Water quality will not be affected. Safety and ease of access of County residents and through travelers will be increased. Existing neighborhoods will not be divided. No Section 4 (f) lands are involved.

EIS-FL-73-0452-D PC$12.50
Naval Facilities Engineering Command, Charleston, S. C. Southern Div.
TRIDENT WHARF AND TURNING BASIN, NAVAL ORDNANCE TEST UNIT, PORT CANAVERAL, FLORIDA. FISCAL YEAR 1974, MCON.
Draft environmental impact statement.
30 Aug 72, 206p ELR-0452
Prepared in cooperation with Gee and Jenson, Consulting Engineers, Inc., West Palm Beach, Fla.

Descriptors: (*Environmental impact statements, *Harbor facilities), (*Florida, Environmental impact statements), Construction, Channels (Waterways), Harbors, Wharves, Dredging, Spoils, Military facilities.
Identifiers: *Port Canaveral (Florida), Trident Wharf and Turning Basin.

The project consists of the construction of a new turning basin, deepening of the existing harbor entrance channel, and construction of a wharf, and attendant shore-based facilities. Approximately 8,600,000 cubic yards of material would be dredged from uplands and about 4,000,000 cubic yards from the entrance channel. A 1,200 foot long concrete wharf will be constructed within the turning basin. Beach restoration is contemplated for 2.8 miles of Atlantic Ocean shoreline. Channel dredging and spoiling and beach nourishment spoiling will temporarily degrade water quality, destroy most benthic organisms in the dredge and submerged spoil areas, and severely restrict public beach use during construction. About 100 acres of terrestrial environment will be converted to marine environment with a depth of 41 feet mean low water. Approximately 156 acres of upland will be covered with clayey spoil material.

EIS-FL-73-0455-F PC$5.00/MF$0.95
Army Engineer District, Mobile, Ala.
CHOCTAWHATCHEE RIVER AND HOLMES CREEK, FLORIDA. PERMIT APPLICATION FOR SNAG REMOVAL BY FLORIDA GAME AND FRESH WATER FISH COMMISSION.
Final environmental impact statement.
16 Jun 72, 59p ELR-0455
Supersedes report dated 2 Nov 71, PB-203 770-D.

Descriptors: (*Environmental impact statements, *Channel improvements), (*Florida, Environmental impact statements), Channels (Waterways), Cleaning, Recreational facilities.
Identifiers: Choctawhatchee River, Holmes Creek, Snag removal.

It is proposed to selectively snag the Choctawhatchee River from the Alabama-Florida State line to the mouth and Holmes Creek from Vernon to its confluence with the Choctawhatchee to provide safe navigation for small pleasure boats. Environmental impacts include reduction of aquatic habitat for invertebrates and algae; increase in opportunity for safe usage of the resource for boating, fishing, and general recreation. Adverse environmental effects are the reduction of aquatic habitat; temporary increase in turbidity; and insignificant effect upon biota.

EIS-FL-73-0469-D PC$4.00
Federal Highway Administration, Tallahassee, Fla. Florida Div.
STATE PROJECT NOS. 26260-1420 (F.A.P. FI-7-5-2 (42)123, I-75-SR 24 INTERCHANGE, 26090--1504 (F.A.P. S-611 (3), S.R. 24, 26004-1502 (F.A.P. US-717 (1), S.R. 728 ALACHUA COUNTY, FLORIDA, SAI NO. 72-1093.
Draft environmental impact statement.
Mar 73, 40p FHWA-FLA-EIS-72-02-D ELR-0469
Prepared in cooperation with Florida State Dept. of Transportation.

Descriptors: (*Environmental impact statements, *Roads), (*Florida, Environmental impact statements), Interchanges, Improvement, Eminent domain, Traffic engineering, Traffic safety, Construction, Streets.
Identifiers: *Gainesville (Florida), Florida route 24.

The projects in Gainesville, Florida, consist of the provision of an interchange, six-laning of State Road 24, four-laning of State Road 24 to North-South Drive, and providing a four-lane facility from State Road 24 to State Road 331. The environmental impacts are displacement and increased noise levels, along with encroachment through a residential subdivision and an Audubon bird sanctuary if one alternate is selected. Long-term benefits will be greater accessibility and reduced congestion. A substantial reduction in the accident rate is expected.

EIS-FL-73-0474-F PC$6.25
Federal Highway Administration, Tallahassee, Fla. Florida Div.
THE FOUR (4) LANING OF SR 530A FROM THE INTERSECTION OF SR530-SR535 TO THE FLORIDA TURNPIKE IN OSCEOLA COUNTY, FLORIDA.
Final environmental impact statement.
Mar 73, 84p FHWA-FLA-EIS-72-24-F ELR-0474
Supersedes report dated Jul 72, EIS-FL-72-4936-D. Prepared in cooperation with Florida State Dept. of Transportation.

Descriptors: (*Environmental impact statements, Highways), (*Florida, Environmental impact statements), Limited access highways, Construction, Traffic engineering.
Identifiers: *Osceola County (Florida), Florida route 530A.

The project involves the construction of a new four (4) lane limited access facility (SR530A) from the intersection of SR530-SR535 eastward 5.5 miles to the Florida Turnpike in northern Osceola County. The proposed project may have significant social impact of a disruptive nature unless special care is taken to preserve the level of service and capacity on existing SR530. There will be no Section 4 (f) involvement. No adverse biological or physical environmental effects are expected. Detailed discussion of the issues and specific probable impacts of the proposed project are included.

EIS-FL-73-0476-F-S
PC$6.75/MF$0.95
Army Engineer District, Jacksonville, Fla.
JACKSONVILLE HARBOR (SECTIONS 1 AND 2), JACKSONVILLE, FLORIDA.
Supplement to Final environmental impact statement.
Oct 72, 92p ELR-0476
See also report dated 3 Jul 72, EIS-FL-72-4826-F.

Descriptors: (*Environmental impact statements, *Harbors), (*Florida, Environmental impact statements), Channel improvements, Dredging, Excavation, Blasting, Waterways (Transportation), Fishes, Shrimps, Water quality.
Identifiers: *Jacksonville (Florida), Jacksonville Harbor.

Description of action: Approximately 60,000 cubic yards of material of a total of about 600,000 cubic yards of relatively hard rock to be excavated in the Jacksonville Harbor, Sections 1 and 2 reaches, will have to be removed by blasting. On the basis of available information some environmental damage to and disruption of aquatic life will occur in the immediate vicinity of blasting operations. This will include a loss of some fish and shrimp which happen to be in the immediate blasting area at the time of blasting. The exact extent of such losses is difficult to predict. However, viewed in the light of available information on total annual river and ocean shrimp catches, these losses are expected to be extremely small. Analyses by responsible Federal and State agencies having geologic expertise indicate that blasting will have no effect on the deep Floridan aquifer and is unlikely to produce any noticeable impact on the shallow aquifer or on shallow wells in the vicinity of the blasting. Some temporary increase in turbidity will result from blasting with only minimal impact anticipated. Completion of the project will have a long-range impact on the economy of the region in terms of benefits produced. Turbidities in the area will increase temporarily during blasting operations and some siltation could result. Fish and shrimp swimming in the immediate area of blasting will be killed.

EIS-FL-73-0491-F-1
PC$39.25/MF$0.95
Environmental Protection Agency, Atlantic Ga. Region IV.
OCEAN OUTFALLS AND OTHER METHODS OF TREATED WASTE WATER DISPOSAL IN SOUTHEAST FLORIDA. TRANSCRIPT OF PROCEEDINGS HELD IN LAKE WORTH, FLORIDA, JANUARY 24, 1973, MIAMI BEACH, FLORIDA, JANUARY 26, 1973, FORT LAUDERDALE, FLORIDA, JANUARY 27, 1973.
Final environmental impact statement.
Mar 73, 745p ELR-0491-F-1
Supersedes report dated Dec 72, EIS-FL-72-5808-D. See also rept. dated Mar 73, EIS-FL-73-0491-F-2.

Descriptors: (*Environmental impact statements, *Waste disposal), (*Florida, Environmental impact statements), (*Outfall sewers, Environmental impact statements), Plumes, Coral, Reefs, Surface waters, Groundwater, Canals, Septic tanks, Water pollution, Sewage treatment, Water quality, Water supply, Sludge disposal, Injection wells, Proceedings, Meetings.
Identifiers: *Palm Beach County (Florida), *Broward County (Florida), *Dade County (Florida), Ocean waste disposal, *Sewage treatment effluent, *Liquid waste disposal, Sewage irrigation.

The statement is an examination of the impact on man and his environment of treated wastewater disposal methods in Southeast Florida. The study area is defined as Palm Beach, Broward and Dade Counties, and their contiguous inland and coastal waters. Because Federal law requires that secondary treatment with disinfection be provided for all wastewater discharges, the report looks at impact various waste water disposal methods will have. The methods considered are: discharge to the ocean via ocean outfalls, discharge to fresh water canals and to estuarine waters, injection into the shallow and deep groundwater aquifiers, discharge into the Everglades, and land disposal by irrigation, spray runoff, and percolation. In addition, the environmental impact of continued septic tank disposal and 'no action', in the sense of no improvement in methods of disposal over current practices, are presented. The statement takes into consideration wastewater flows projected by local, State, and Federal agencies as they relate to existing or proposed facilities.

EIS-FL-73-0491-F-2
PC$33.25/MF$0.95
Environmental Protection Agency, Atlantic, Ga. Region IV.
OCEAN OUTFALLS AND OTHER METHODS OF TREATED WASTEWATER DISPOSAL IN SOUTHEAST FLORIDA. TRANSCRIPT OF PROCEEDINGS HELD IN LAKE WORTH, FLORIDA, JANUARY 24, 1973, MIAMI BEACH, FLORIDA, JANUARY 26, 1973, FORT LAUDERDALE, FLORIDA, JANUARY 27, 1973.
Final environmental impact statement.
Mar 73, 624p ELR-0491-F-2
Supersedes report dated Dec 72, EIS-FL-72-5808-D. See also rept. dated Mar 73, EIS-FL-73-0491-F-1.

Descriptors: (*Environmental impact statements, *Waste disposal), (*Florida, Environmental impact statements), (*Outfall sewers, Environmental impact statements), Proceedings, Plumes, Coral, Reefs, Surface waters, Ground water, Canals, Septic tanks, Nutrients, Sewage treatment, Water quality, Water supply, Sludge disposal, Injection wells.
Identifiers: *Palm Beach County (Florida), *Dade County (Florida), *Broward County (Florida), Ocean waste disposal, *Sewage treatment effluent, *Liquid waste disposal, Sewage irrigation.

The report contains a transcript of public hearings of public hearings held on the draft environmental impact statement concerning ocean outfalls in southeast Florida.

EIS-FL-73-0516-F PC$10.25/MF$0.95
Environmental Protection Agency, Atlanta, Ga. Region IV.
NORTH BROWARD COUNTY, FLORIDA.
Final environmental impact statement.
20 Mar 73, 163p ELR-0516

Descriptors: (*Environmental impact statements, *Waste treatment), (*Florida, Environmental impact statements), Waste water, Pumping stations, Construction, Soil erosion, Right of way acquisition, Noise (Sound).
Identifiers: Broward County (Florida).

The action consists of the construction of wastewater pumping stations, wastewater force mains, wastewater treatment plant, and a wastewater treatment plant ocean outfall in North Broward County, Florida. The proposed project will have both beneficial and adverse impacts on the environment; however, the beneficial effects outweigh the adverse effects. There will be some unavoidable adverse effects related to the actual construction of facilities, including construction noise, traffic, clearing of right-of-way stripping of trees and foliage, and soil erosion. Many of these effects will be minimized by construction precautions.

EIS-GA-73-0403-D PC$3.50
Army Engineer District, Savannah, Ga.
TYBEE ISLAND, GEORGIA, BEACH EROSION CONTROL.
Draft environmental impact statement.
Dec 72, 30p ELR-0403

Descriptors: (*Environmental impact statements, *Shore protection), (*Georgia, Environmental impact statements), Beach erosion, Erosion control, Ocean environments, Groins (Structures), Economic development, Tidal currents.
Identifiers: *Tybee Island (Georgia).

The action consists of restoration and periodic nourishment of 13,200 feet of ocean beach and a rubble stone terminal groin extending 800 feet seaward on Tybee Island, Georgia. Environmental impacts include the restoration and maintenance of scenic beach area, stabilization of an eroding shoreline, sport fishery habitat, enhancement of the island community, and improvement of economic conditions. Adverse environmental effects include temporary reduced water quality, fishery population, and disruption of benthic community during construction; possible diversion of normal tidal currents and littoral drifts.

EIS-GA-73-0416-F PC$5.50/MF$0.95
Army Engineer District, Savannah, Ga.
PEACOCK CREEK, LIBERTY COUNTY, GEORGIA.
Final environmental impact statement.
Nov 72, 70p ELR-0416
Supersedes report dated 23 Jul 71, PB-201 389-D.

Descriptors: (*Environmental impact statements, *Flood control), (*Georgia, Environmental impact statements), Drainage, Rural areas, Streams, Channel improvements.
Identifiers: Liberty County (Georgia), Peacock Creek.

The project proposes to initiate flood control measures consisting of improved channel dimensions, snagging, and clearing on Peacock Creek. The project will provide flood protection, afford the orderly removal of standing surface water, stimulate area development, and enhance the environment for human habitation. Adverse environmental effects are removal of hardwoods and other biota from project right-of-way, possible increase in water temperature, probable decrease in dissolved oxygen and temporary turbidity during construction.

EIS-GA-73-0479-D PC$4.25
Federal Aviation Administration, Washington, D.C. Airports Service.
BRUNSWICK AIRPARK AIRPORT, BRUNSWICK, GEORGIA.
Draft environmental impact statement.
Feb 73, 45p ELR-0479
Prepared in cooperation with Brunswick, Glynn County Joint Planning Commission, and Coastal Area Planning and Development Commission, Ga.

Descriptors: (*Environmental impact statements, *Airports), (*Georgia, Environmental impact statements), Construction, Runways, Improvement, Aviation lighting, Land acquisition.
Identifiers: Brunswick Airpark Airport, Brunswick (Georgia), Glynn County (Georgia).

The proposed project involves the construction of an extension (1156 ft x 75 ft) and resurfacing the existing runway; the installation of a new medium intensity runway lighting system and abbreviated approach slope indicator; the acquisition of additional land (5.2 acres fee simple title and 7.9 acres easement) for clear zone approaches; approach clearing; relocation of utilities; pavement marking and other miscellaneous items. The extension will result in development of a General Utility airport adequate for accommodating substantially all propeller aircraft weighing less than 12,500 pounds on a 24-hour basis. This includes all single engine aircraft and some light twin-engine propeller driven aircraft. There were no significant adverse environmental effects associated with this project.

EIS-GA-73-0539-D PC$4.75
Federal Aviation Administration, Washington, D.C. Airports Service.
EMANUEL COUNTY AIRPORT, SWAINSBORO, GEORGIA.
Draft environmental impact statement.
Mar 73, 55p ELR-0539

Descriptors: (*Environmental impact statements, *Airports), (*Georgia, Environmental impact statements), Construction, Runways, Aviation lighting, Air pollution, Right of way acquisition.
Identifiers: Emanuel County Airport, Swainsboro (Georgia).

Emanuel County, Georgia is considering a request for federal funds under the Airport and Airway Development Act for a project to: Acquire about 124.8 acres for crosswind runway, runway extension and clear zones; Construct runway extension 820' x 100' (total length 5000') and parallel taxiway extension; Widen existing runway to 100'; Construct new crosswind runway (3200' x 60'); Construct new apron and hangar facilities; Install medium intensity lighting on runway and taxiway extensions; and to Install perimeter fencing; and, Other miscellaneous items associated with this development. This construction will result in development of a basic transport airport which will accommodate 70 percent of the basic transport fleet of turbojet-powered aircraft weighing less than 60,000 pounds. There will be approximately 50 acres of clearing; increased intermittent noise levels due to occasional operations by small 'business jet' aircraft; and slightly increased air pollution due to operation of these aircraft.

EIS-HI-73-0442-D PC$3.00
Corps of Engineers, Honolulu, Hawaii. Pacific Ocean Div.
NAWILIWILI SMALL BOAT HARBOR, KAUAI, HAWAII.
Draft environmental impact statement.
26 Jan 73, 15p ELR-0442

Descriptors: (*Environmental impact statements, *Harbors), (*Hawaii, Environmental impact statements), Construction, Breakwaters, Channel improvements, Bays (Topographic features), Aquatic animals.
Identifiers: Nawiliwili Bay, *Kauai (Hawaii).

Construction is proposed of a small boat harbor in Nawiliwili Bay, Hawaii, with a design capacity of about 166 small craft consisting of a breakwater and revetted dike, a stub breakwater, and navigation channels. Construction will result in berthing area for about 50 craft. Implementation of the proposed plans will alter a portion of the existing tidal flat area of Nawiliwili Bay to a light draft vessel harbor complex of about 18 acres. The harbor would improve berthing conditions, stimulate boating conditions for all small craft, and enhance the recreational use of the bay. Although reduced in size, estuarine portions in the bay should remain unchanged, and the biological communities unaffected, with the exception of the crab community in the immediate project area. No rare or endangered species nor any areas of historical significance will be affected by the project. Adverse environmental effects include the loss of crab habitat in the immediate project boundaries.

EIS-HI-73-0508-D PC$6.25
Department of Housing and Urban Development, San Francisco, Calif. San Francisco Area Office.
PAUAHI URBAN RENEWAL PROJECT, HAWAII R-15.
Draft environmental impact statement.
Mar 73, 82p HUD-R09-EIS-73-5D ELR-0508

Descriptors: (*Environmental impact statements, *Urban renewal), (*Hawaii, Environmental impact statements), Demolition, Construction, Rehabilitation, Residential buildings, Parking facilities, Commercial buildings, Land use.
Identifiers: *Chinatowns, *Housing and development research.

Modification is proposed of a 2 block area (Pauahi) in the Chinatown area of downtown Honolulu. Activities include demolition of unsound structures, rehabilitation of structures of historical significance, construction of 2 high-rise residential towers, 1 large off-street parking facility, several low-rise multiple structures, several commercial structures, and several parks and plazas within the project area. The neighborhood will be physically and economically upgraded. Social impacts will involve increased densities, additional school demands, sewer demands, transportation demands, and power demands.

EIS-IA-73-0402-D PC$5.50
Federal Highway Administration, Ames, Iowa. Iowa Div.
EXPRESSWAY IOWA 330 IN JASPER-STORY-MARSHALL COUNTIES, FROM JUNCTION IOWA 117 AND U.S. 65, TO U.S. 30, IOWA.
Draft environmental impact statement.
Mar 73, 67p FHWA-IOWA-EIS-73-03-D ELR-0402
Prepared in cooperation with Iowa State Highway Commission.

Descriptors: (*Environmental impact statements, *Highways), (*Iowa, Environmental impact statements), Reconstruction, Alignment, Right of way acquisition, Relocation, Wildlife, Residential buildings.
Identifiers: *Iowa expressway 330, Jasper County (Iowa), Story County (Iowa), Marshall County (Iowa).

The proposed project is an upgrading of present Iowa 330 on the existing alignment. It would involve either building two new lanes or reconstructing the existing roadway and purchasing additional right-of-way for an eventual four-lane facility. It would begin at the junction of U.S. 65 and Iowa 117 and would terminate at the junction with U.S. 30. The project length would be 20.2 miles. The proposed project would displace approximately 2 residences and 2 farmsteads. It would remove cropland from productivity and also several small timbered tracts which also constitute wildlife habitat. Noise and exhaust emissions in the corridor would increase due to increases in traffic volumes. Benefits to be derived from the improvement would consist primarily of safer and more efficient transportation in the project corridor.

EIS-IA-73-0451-D PC$6.50
Federal Highway Administration, Ames, Iowa. Iowa Div.
GUTHRIE AVENUE VIADUCT AND APPROACHES, DES MOINES, POLK COUNTY, IOWA.
Draft environmental impact statement.
Mar 73, 86p FHWA-IA-EIS-72-08-D ELR-0451
Prepared in cooperation with Iowa State Highway Commission.

Descriptors: (*Environmental impact statements, *Viaducts), (*Iowa, Environmental impact statements), Streets, Highway bridges, Urban areas, Construction, Bridge approaches, Eminent domain, Improvement, Traffic engineering.
Identifiers: Polk County (Iowa), Des Moines (Iowa).

The proposal is to construct a 660 foot, four-lane viaduct and approaches on Guthrie Avenue in Des Moines, Iowa. The total project length is 3,010 feet. The project will improve traffic service in the study area, relieve existing and forecast traffic congestion, and improve access to the Central Terminal Industrial Park. There will be some negative impact upon the residential neighborhood in terms of disruption, inconvenience, and noise. Six single family dwellings and two commercial properties will be displaced.

EIS-IA-73-0473-F PC$5.00/MF$0.95
Federal Highway Administration, Ames, Iowa. Iowa Div.
FREEWAY 520, BLACK HAWK COUNTY, IOWA.
Final environmental impact statement.
Mar 73, 59p FHWA-IA-EIS-72-02-F ELR-0473
Supersedes report dated 27 Jan 72, PB-206 260-D.
Prepared in cooperation with Iowa State Highway Commission.

Descriptors: (*Environmental impact statements, *Highways), (*Iowa, Environmental impact statements), Freeways, Construction, Interchanges, Eminent domain.
Identifiers: Black Hawk County (Iowa), Iowa route 520.

The proposed project will begin at an interchange with U.S. 218 in Waterloo, proceed easterly across the Cedar River to an interchange with River Forest Road in Evansdale. From this interchange the project will continue easterly and end at an interchange with Iowa 297. The roadbed will act as a flood protection levee over part of its length. This portion of the project is being built in cooperation with the U.S. Army Corps of Engineers. Total project length is 5.6 miles. The project will divert some agricultural, residential and flood plain land from their present use. The project will displace approximately 47 houses and 8-9 businesses. Air and noise pollution in the immediate area will be increased but an overall decreasing effect may occur for metropolitan Waterloo. No 4 (f) lands are affected by the project.

EIS-ID-73-0436-F PC$5.50/MF$0.95
Soil Conservation Service, Boise, Idaho.
GEORGETOWN CREEK WATERSHED PROJECT, BEAR LAKE COUNTY, IDAHO.
Final environmental impact statement.
Feb 73, 68p ELR-0436, USDA-SCS-ES-WS (Adm)-73-3-F.
Supersedes report dated 26 Jul 72, EIS-ID-72-4949-D.

Descriptors: (*Environmental impact statements, *Land reclamation), (*Idaho, Environmental impact statements), Watersheds, Soil erosion, Channel improvements, Irrigated land, Flood control, Water supply, Water quality, Fisheries.
Identifiers: Georgetown Creek Watershed, Bear Lake County (Idaho).

Land treatment measures, channel work, and improved irrigation distribution system of the Georgetown Creek Watershed, Bear Lake County, Idaho, for watershed protection, flood prevention, and irrigation is proposed. The project will reduce erosion, floodwater, and sediment damage, improve water quality, eliminate health hazards, stimulate improved economic returns, and cause seasonal loss of approximately 1 1/2 miles of fishing stream.

EIS-IL-73-0443-F PC$4.25/MF$0.95
Federal Aviation Administration, Washington, D.C. Airports Service.
OLNEY-NOBLE AIRPORT, RICHLAND COUNTY, OLNEY-NOBLE, ILLINOIS.
Final environmental impact statement.
Mar 73, 45p ELR-0443
Supersedes report dated 9 May 72, PB-209 041-D.

Descriptors: (*Environmental impact statements, *Airports), (*Illinois, Environmental impact statements), Construction, Land acquisition, Runways, Taxiways, Aeronautical ground lights, Aircraft noise.
Identifiers: Richland County (Illinois), Olney-Noble Airport.

The project proposed to acquire land for airport development, fee (approximately 40 acres) and easement (approximately 20 acres), and to construct, light and mark NW/SE 3900' x 75' runway, turnarounds, and exit taxiway, VASI-2 both runway ends and obstruction removal.

EIS-IL-73-0499-F PC$4.25/MF$0.95
Federal Highway Administration, Springfield, Ill. Illinois Div.
FAI (INTERSTATE) ROUTE 70, US 40 AND RANDOLPH STREET IN AND ADJACENT TO VANDALIA, ILLINOIS.
Final environmental impact statement.
Mar 73, 43p FHWA-ILL-EIS-72-21-F ELR-0499
Supersedes report dated 1 Jun 72, EIS-ILL-EIS-72-4610-D. Prepared in cooperation with Illinois State Dept. of Transportation.

Descriptors: (*Environmental impact statements, *Highways), (*Illinois, Environmental impact statements), Construction, Improvement, Right of way acquisition, Interchanges, Streets, Rural areas.
Identifiers: *Interstate highway 70, *Vandalia (Illinois).

The project provides for the improvement of FAI Route 70, US 40, and Randolph Street, in and adjacent to the western limit of Vandalia, Illinois, for a total length of 5.7 miles over a period of five years. The proposed action involves the design of a new interchange with connecting roadways. Economic benefits are positive. Safety will be improved and traffic capacity will be increased. Predominant land use activity in the area is agriculture. Mineral industry is significant due to oil production and extensive coal deposits.

EIS-IL-73-0530-F PC$5.75/MF$0.95
Federal Highway Administration, Springfield, Ill. Illinois Div.
FA ROUTE 404, GALESBURG TO MONMOUTH, KNOX AND WARREN COUNTIES, ILLINOIS.
Final environmental impact statement.
Mar 73, 73p FHWA-ILL-EIS-71-16-F ELR-0530
Supersedes report dated 6 Aug 71, PB-201 703-D. Prepared in cooperation with Illinois State Dept. of Transportation.

Descriptors: (*Environmental impact statements, *Highways), (*Illinois, Environmental impact statements), Freeways, Construction.
Identifiers: Knox County (Illinois), Warren County (Illinois), Illinois route 404.

Proposed Supplemental Freeway FA 404 would begin Northeast of Galesburg, Illinois at Interstate 74 and proceed around Galesburg to a crossing with U.S. 34. From here the highway would proceed in westerly direction near Monmouth, Illinois ending at Burlington, Illinois. The portion under consideration is between Monmouth in Warren County and Galesburg in Knox County. Proposed FA 404 is on a new location causing an increase in the ambient noise level and air pollution. Some short term affects on the environment are expected during construction and immediately after completion. These effects include minor channel changes to Cedar Creek and removal of some pasture and timber for the highway with the resulting displacement of some wildlife. However, these short term effects are not thought to be significant and the long term effects of the highway should benefit both local and long distance travelers by replacing the existing route.

EIS-IN-73-0522-D PC$7.50.
Forest Service, Milwaukee, Wis. Eastern Region.
OFF ROAD VEHICLE POLICY, HOOSIER NATIONAL FOREST, INDIANA.
Draft environmental impact statement.
14 Mar 73, 110p ELR-0522, USDA-FS-DES (Adm)-73-51

Descriptors: (*Environmental impact statements, *National parks), (*Indiana, Environmental impact statements), Regulations, Vehicular traffic, Zoning, Forest land.
Identifiers: *Hoosier National Forest.

The statement proposes a policy to permit and regulate the use of off-road motor vehicles on the Hoosier National Forest. The policy will divide the Hoosier National Forest into two different type zones. Part of the Forest will be zoned for the use of off-road motor vehicles on designated trails; off-road vehicles will be prohibited from the remainder of the Forest. The counties of Monroe, Brown, Jackson, Lawrence, Martin, Dubois, Orange, Crawford and Perry in southern Indiana will be affected by this policy. The proposed policy is only effective on National Forest lands; it does not cover thejpublic road system or other Federal, State, or private land. Zoning the Forest into 'open' and 'closed' off-road vehicle areas and restricting the operation of off-road motor vehicles to designated trails on the open portion will favorably affect the soils, watershed, vegetation, and wildlife conditions on the Hoosier National Forest. Water, air and noise pollution will be reduced. Some land will be taken out of wildlife production. There will be some increases in localized air pollution. Fire risk along ORV trails will be increased.

EIS-IN-73-0543-D PC$5.00
Federal Aviation Administration, Washington, D.C. Airports Service.
STARKE COUNTY AIRPORT, KNOX, INDIANA.
Draft environmental impact statement.
Dec 72, 59p ELR-0543

Descriptors: (*Environmental impact statements, *Airports), (*Indiana, Environmental impact statements), Construction, Runways, Aviation lighting, Roads, Right of way acquisition, Farms, Air pollution.
Identifiers: Starke County Airport, Knox (Indiana).

The following is proposed: Land acquisition for airport development and clear zones (266 acres fee, 64 acres avigation easements.); Relocate utilities and remove obstructions; Grade, drain and turf to construct runway 18-36, connecting taxiways, apron and turn-around; Install medium intensity runway lighting system (MIRL) including visual approach slope indicator system (VASI); Install wind cone and segmented circle; Construct entrance road, auto parking lot, fencing, administration building, and waste water treatment facilities. A summary of adverse impacts include the following: Minor increases in air pollution; Four families now live within 1985-100<CNR<115 area; and, Loss of farm land.

EIS-KS-73-0513-D PC$5.75
Federal Aviation Administration, Kansas City, Mo. Airports Div.
PRATT MUNICIPAL AIRPORT, PRATT, KANSAS.
Draft environmental impact statement.
Mar 73, 75p ELR-0513

Descriptors: (*Environmental impact statements, *Airports), (*Kansas, Environmental impact statements), Improvement, Runways, Taxiways, Aviation lighting.
Identifiers: Pratt (Kansas), Pratt Municipal Airport, Pratt County (Kansas).

The project consists of the preparation of a Master Plan for the Pratt Municipal Airport, which, in turn, recommends improvements on the runways, taxiways, lighting, terminal area, and hangar area. The proposed improvements will increase aircraft operations resulting in an increase in noise and air pollution. Air and noise pollution will be generated also from increased motor vehicle traffic to and from the airport. Drainage improvements will expose soil to wind and water erosion, which will result in temporary air and water pollution. The Pratt Feedlot, Inc., although designed and managed to keep pollution to a minimum, does present a potential source of pollution in the form of polluted runoff from the feedlot pens as a result of precipitation, accumulation of large quantities of manure in stockpiles and malodors from the feeding operation.

EIS-KY-73-0462-D PC$5.50
Federal Highway Administration, Frankfort, Ky. Kentucky Div.
AFD537 (21), LAWRENCE COUNTY AP10-8-5-30L AND BOYD COUNTY AP64-113-10L, THE LOUISA-CATLETTSBURG ROAD (U.S. 23), KENTUCKY.
Draft environmental impact statement.
Mar 73, 68p FHWA-KY-73-03-D ELR-0462
Prepared in cooperation with Kentucky State Dept. of Highways.

Descriptors: (*Environmental impact statements, *Highways), (*Kentucky, Environmental impact statements), Construction, Traffic engineering, Eminent domain.
Identifiers: Lawrence County (Kentucky), Boyd County (Kentucky), Kentucky route 23.

The project proposes construction of a four-lane facility between Louisa and Catlettsburg. The new facility generally follows existing Route 23 with minor relocations. The total length is 20.5 miles extending from KY 23, 1 1/2 miles northwest of Louisa, to I-64, 1 1/2 miles south of Catlettsburg. Beneficial Consequences include the following: More efficient transportation; Improved appearance; Increased safety; Increase of tourism. Disadvantages include the following: Displacement of residences and businesses; Temporary inconvenience to the through and local highway users; Limited sedimentation, erosion, dust and noise during the construction period.

EIS-KY-73-0540-F PC$4.75/MF$0.95
Federal Aviation Administration, Washington, D.C. Airports Service.
HENDERSON CITY-COUNTY AIRPORT, HENDERSON, KENTUCKY.
Final environmental impact statement.
Mar 73, 53p ELR-0540
Supersedes report dated 19 Jun 72, EIS-KY-72-4730-D.

Descriptors: (*Environmental impact statements, *Airports), (*Kentucky, Environmental impact statements), Site selection, Relocation, Construction, Runways, Taxiways, Aviation lighting.
Identifiers: Henderson (Kentucky), Henderson City-County Airport.

The City and County of Henderson, Kentucky have requested Federal Aviation Administration concurrence in a new airport to replace the existing Henderson City-County Airport. This action is precipitated by the proposed construction of an electrical generating facility in the vicinity of the existing airport site. The proponent of the generating facility will construct the replacement airport without cost either to the sponsor or Federal Government in exchange for the present site. The development will consist of the following: Paved Runway (5000 ft x 100 ft) including apron and taxiways; medium intensity lighting system; instrument landing system; terminal building; hangers; 2000 ft x 150 ft cross wind turf landing strip and other miscellaneous items. There will be approximately 30 to 40 scattered trees which must be cleared; increased intermittent noise levels due to occasional operations of small business-jet aircraft; and slightly increased air pollution due to operation of these aircraft and short-term adverse environmental effects associated with normal construction.

EIS-LA-73-0440-F PC$5.75/MF$0.95
Federal Aviation Administration, Washington, D.C. Airports Service.
MONROE MUNICIPAL AIRPORT, MONROE, LOUISIANA.
Final environmental impact statement.
Mar 73, 72p ELR-0440
Supersedes report dated 8 Jun 72, EIS-LA-72-4670-D.

Descriptors: (*Environmental impact statements, *Airports), (*Louisiana, Environmental impact statements), Construction, Land acquisition, Improvement, Aircraft noise.
Identifiers: Monroe Municipal Airport, Monroe (Louisiana).

Improvements to Monroe Municipal Airport, Ouachita Parish, Louisiana are proposed. Included are land acquisition for clear zones and airport development; remove obstructions; construct 2500' x 150' extension (stage construction) to runway 4/22 and parallel taxiway; widen taxiways; construct holding aprons; strengthen runway 4/22, terminal apron, and taxiways; install MIRL runway 13/31; install HIRL runway 4/22; install MITL; groove and mark runway 4/22. The only adverse environmental effect generated by the airport project will be the increase in noise levels over a small number of residences caused by the change in the flight pattern; however, it will reduce the noise level for approximately 30 families underlying the old flight pattern.

EIS-LA-73-0444-D PC$7.50
Army Engineer District, New Orleans, La.
MISSISSIPPI RIVER, BATON ROUGE TO THE GULF OF MEXICO, LOUISIANA.
Draft environmental impact statement.
29 Jan 73, 106p ELR-0444

Descriptors: (*Environmental impact statements, *Channel improvements), (*Mississippi River, Environmental impact statements), (*Louisiana, Environmental impact statements), Dredging, Maintenance, Jetties, Benthos, Water pollution, Spoil, Mexico Gulf.
Identifiers: *Baton Rouge (Louisiana).

A navigation project provides for maintaining channels of specified dimensions in the Mississippi River from Baton Rouge, Louisiana, to deep water in the Gulf of Mexico. The action consists principally of maintenance dredging at eight crossings, regulating and contracting works, and maintenance of jetty systems. A few benthic effects are minimal when compared to the total benthic population of the river bottom. Some pollutants settled on the river bottom are placed back into suspension by dredging operations.

EIS-LA-73-0448-D PC$5.75
Army Engineer District, New Orleans, La.
RED RIVER BELOW DENISON DAM, WEST AGURS LEVEE, LOUISIANA.
Draft environmental impact statement.
Jan 73, 71p ELR-0448
See also report dated Jan 73, EIS-AR-73-0449-D.

Descriptors: (*Environmental impact statements, *Flood control), (*Louisiana, Environmental impact statements), Construction, Wells, Levees, Channel improvements.
Identifiers: *Caddo Parish (Louisiana).

The project proposes construction of about 232 wells (2 feet in diameter and 22 feet in depth, at 50-foot intervals along the borrow pit for extending the thalweg of the pit sufficiently into the pervious sand materials) to insure the integrity of the West Agurs levee along the left descending bank of Twelvemile Bayou during periods of high-water levels. Located in Caddo Parish, La. The proposed construction will protect about 700 acres of the West Agurs area from frequent and severe overflows from Red River backwater and headwater floods originating in the Cypress Creek-Twelvemile Bayou Basin. Implementation will not impose any significant physical alteration to the existing environment. The adverse effects of the plan are of such a minor nature that other coordinating Federal and state agencies have not assigned any specific losses which would result from implementation of the proposal and measures other than the protective and remedial types are not warranted.

EIS-LA-73-0519-F PC$16.25/MF$0.95
Directorate of License (AEC), Washington, D. C.
CONSTRUCTION OF WATERFORD STEAM ELECTRIC STATION, UNIT 3, LOUISIANA POWER AND LIGHT COMPANY, DOCKET NO. 50-382.
Final environmental impact statement.
Mar 73, 285p ELR-0519
Supersedes report dated Oct 72, EIS-LA-72-5549-D.

Descriptors: (*Environmental impact statements, *Nuclear power plants), (*Louisiana, Environmental impact statements), Construction, Licenses, Pressurized water reactors, Water pollution, Site surveys, Ecology.
Identifiers: *Saint Charles Parish (Louisiana), Mississippi River.

The proposed action is issuance of a permit for the construction of the Waterford Steam Electric Station, Unit No. 3, a nuclear power reactor to be located on a site which will also be occupied by two oil-fueled electrical generating plants now under construction. The site is on the Mississippi River in the state of Louisiana near the town of Taft. The Unit will employ a pressurized water reactor, by Combustion Engineering, Inc. to produce 3390 megawatts thermal (MWt). A steam turbine-generator will use this heat to provide approximately 1165 MW (net) of electrical power capacity. A 'stretch' power level of 3560 MWt is anticipated at a future date and is considered in the assessments contained in this statement. The exhaust steam will be cooled by once-through flow of water obtained from and discharged to the Mississippi River. A summary of the environmental impact and effects is given.

EIS-MA-73-0400-D PC$3.75
Corps of Engineers, Waltham, Mass. New England Div.
WEYMOUTH-BRAINTREE, MASSACHUSETTS, LOCAL PROTECTION PROJECT.
Draft environmental impact statement.
Nov 72, 34p ELR-0400

Descriptors: (*Environmental impact statements, *Flood control), (*Massachusetts, Environmental impact statements), Construction, Concrete dams, Water pipelines, Excavation, Channel improvements, Water quality, Trees (Plants).
Identifiers: *Norfolk County (Massachusetts).

A flood control project in Norfolk County consisting of a concrete dam, about 1,200 feet of 96-inch pressure pipe, a 230 foot long multi plate arch con-

duit, and approximately 1,000 feet of channel excavation will provide additional flood protection and improved water quality. The reflooding of Pond Meadow will enhance the natural resources and provide a recreation facility. Loss of a limited amount of hardwood trees and other vegetation may be expected during construction activities at the dam site and along the channel improvement area.

EIS-MA-73-0514-F PC$22.50/MF$0.95
Corps of Engineers, Waltham, Mass. New England Div.
ADDITION OF UNIT NO. 4, SALEM HARBOR ELECTRIC GENERATING STATION, SALEM, MASSACHUSETTS.
Final environmental impact statement.
Nov 72, 407p ELR-0514
Supersedes report dated 30 Jun 72, EIS-MA-72-4813-D.

Descriptors: (*Environmental impact statements, *Thermal power plants), (*Massachusetts, Environmental impact statements), Harbors, Water quality, Piers, Aquatic animals.
Identifiers: *Salem (Massachusetts).

The action is the addition of a 465 MW electric generating unit which will consist of boiler and turbine buildings,stack and substations. Modifications to the existing sea water intake and discharge facilities will also be made. Environmental impacts are outlined and discussed.

EIS-ME-73-0504-F PC$5.00/MF$0.95
Federal Aviation Administration, Burlington, Mass. Airports Div.
EXTEND, WIDEN, MARK, AND LIGHT RUNWAY, CONSTRUCT PARALLEL TAXIWAY, AND APRON, LAND ACQUISITION, BIDDEFORD MUNICIPAL AIRPORT, BIDDEFORD, MAINE.
Fiaal environmental impact statement.
Jan 73, 57p ELR-0504
Supersedes report dated Oct 72, EIS-ME-72-5592-D.

Descriptors: (*Environmental impact statements, *Airport), (*Maine, Environmental impact statements), Construction, Runways, Taxiways, Aviation lighting, Engine noise, Land acquisition.
Identifiers: *Biddeford Municipal Airport, Biddeford (Maine).

Land acquisition, widen, strengthen, light and extend Runway 6-24 to 5,000 ft. x 100 ft.; construct parallel taxiway 5,000 ft. x 40 ft.; and airport access road; intall security fencing; VASI-2; approach clearing and/or obstruction lighting at the Biddeford Municipal Airport, York County, Biddeford, Maine. Because of the location of the existing airport, there are no apparent identifiable adverse environmental effects resulting from the proposed runway widening and extension. The direction of the extension is to the southwest or away from the residential areas and on secondary type woodland growth. No persons will be displaced as a result of this development. The extended runway will enable larger and possibly noisier type aircraft to utilize this site. The extent of noise pollution for the forseeable future will be objectionable to the few residents that are in very close proximity to the airport.

EIS-MI-73-0470-D PC$8.50
Federal Highway Administration, Lansing, Mich. Michigan Div.
IMPROVEMENT OF US-127 BETWEEN US-12, AND M-50, HILLSDALE, LENAWEE, AND JACKSON COUNTIES, MICHIGAN.
Draft environmental impact statement.
Mar 73, 129p FHWA-MICH-EIS-73-02-D
ELR-0470
Prepared in cooperation with Michigan State Dept. of Highways.

Descriptors: (*Environmental impact statements, *Highways), (*Michigan, Environmental impact statements), Improvement, Construction, Traffic engineering, Eminent domain, Relocation, Pollution.
Identifiers: Hillsdale County (Michigan), Lenawee County (Michigan), Jackson County (Michigan), US highway 127.

The project proposed improvement of US-127 between US-12 and M-50. Hillsdale, Lenawee, and Jackson Counties, Michigan. Positive environmental impacts include the following: Provide better north-south traffic service between the Michigan-Ohio Line and the metropolitan areas of Lansing and Jackson; Safer highway; Provide access and improved service to the feeder routes; Encourage economic activity; and, Increase ease of access to recreation areas. Negative environmental impacts include: Increased sealed surface; Land removed from agricultural production; Displacement of families; Removal of buildings; Removal of vegetation and wildlife habitat; Air pollution; and, Noise pollution.

EIS-MI-73-0496-F PC$9.25/MF$0.95
Federal Highway Administration, Lansing, Mich. Michigan Div.
M-275 ALIGNMENT FROM M-59 NORTH TO I--75, OAKLAND COUNTY, MICHIGAN.
Final environmental impact statement.
Mar 73, 145p FHWA-MICH-EIS-71-02-F
ELR-0496
Prepared in cooperation with Michigan State Dept. of Highways.

Descriptors: (*Environmental impact statements, *Highways), (*Michigan, Environmental impact statements), Alignment, Traffic engineering, Soil erosion, Vegetation, Esthetics.
Identifiers: Michigan route 275, Interstate highway 75, Oakland County (Michigan).

M-275 Alignment from M-59 North to I-75 - Oakland County, Michigan Federal Project F 86-2 is proposed. A summary of environmental impacts is given.

EIS-MI-73-0502-D PC$5.00
Federal Highway Administration, Lansing Mich. Michigan Div.
PROPOSED CONSTRUCTION OF I-69, CHARLOTTE TO I-96 AND I-96 NORTHWEST OF LANSING, CLINTON AND EATON COUNTIES, MICHIGAN.
Draft environmental impact statement.
Mar 73, 57p FHWA-MICH-EIS-73-03-D
ELR-0502
Prepared in cooperation with Michigan State Dept. of Highways.

Descriptors: (*Environmental impact statements, *Highways), (*Michigan, Environmental impact statements), (*Interstate highway system, Environmental impact statements), Construction, Freeways, Interstate transportation, Traffic engineering, Right of way acquisition, Land use.
Identifiers: Clinton County (Michigan), Eaton County (Michigan), Interstate highway 69.

The project proposed construction of I-69, Charlotte to I-96, and I-96 Northwest of Lansing, Clinton and Eaton Counties. Beneficial environmental impacts include the following: Provision of more effective connections with I-496; Provisions of relief to M-43, US-27, and the local roads; Consistency with long range regional development plans; Additional development opportunities for selected locations; Increase the economic viability of the region. Detrimental environmental impacts include the folliwing: No compensation for the loss of intangible property values; Possible diminished economic use of adjacent properties; Alteration of physiographic characteristics; Separation of altering of biotic communities; Imposition of all unavoidable adverse impacts normally associated with highway construction and maintenance.

EIS-MI-73-0523-F PC$9.50/MF$0.95
Army Engineer District, Detroit, Mich.
FLOOD CONTROL ON SAGINAW RIVER, MICHIGAN, AND TRIBUTARIES. FLINT RIVER AT FLINT, SWARTZ AND THREAD CREEKS, SECTIONS C-1 AND D, MICHIGAN.
Final environmental impact statement.
Mar 73, 150p ELR-0523
Supersedes report dated 12 May 72, EIS-MI-72-5186-F.

Descriptors: (*Environmental impact statements, *Flood control), (*Michigan, Environmental impact statements), Channel improvements, Concrete structures, Levees, Land use, Aquatic animals.
Identifiers: *Genesee County (Michigan), Flint River, Saginaw River, Swartz Creek (Michigan), Thread Creek (Michigan).

The project consists of channel realignments and modifications of approximately 11,000 feet of the main stem of Flint River and of approximately 8,900 feet of Swartz and Thread Creeks, tributaries of Flint River. Main features of the plan provide a concrete-lined channel and concrete floodwalls for the river, and an improved earth channel with raised levees along certain sections of the tributaries. The project will provide flood protection for approximately 455 acres of land adjacent to the Flint River and the Swartz and Thread Creek tributaries. It will displace biological communities, remove trees and brush along the creeks, and reduce the park space.

EIS-MN-73-0458-D PC$7.00
Rural Electrification Administration, Washington, D.C.
HENNING TO RUSH LAKE, 230KV TRANSMISSION LINE, OTTER TAIL COUNTY, MINNESOTA.
Draft environmental impact statement.
Feb 73, 100p USDA-REA-ES (ADM)-73-5-D
ELR-0458

Descriptors: (*Environmental impact statements, *Transmission lines), (*Minnesota, Environmental impact statements), Construction, Substations, Vegetation, Wildlife, Esthetics.
Identifiers: *Otter Tail County (Minnesota).

The proposed project is for approximately 12 miles of 230 kV transmission line with a tap switching station at one terminal and a 230 - 41.6 kV substation at the other in Otter Tail County, Minnesota. During the construction, there will be some temporary effects on vegetation and local animal life. Judicious routing will minimize any adverse visual effect.

EIS-MN-73-0482-S PC$3.00/MF$0.95
Federal Aviation Administration, Washington, D. C. Airports Service.
PROPOSED IMPROVEMENTS TO THE DETROIT LAKES AIRPORT, MINNESOTA.
Supplement to draft environmental impact statement.
Feb 73, 9p ELR-0482
See also report dated Feb 73, EIS-MN-73-0235-D.

Descriptors: (*Environmental impact statements, *Airports), (*Minnesota, Environmental impact statements), Construction, Improvement, Runways, Right of way acquisition, Roads.
Identifiers: Detroit Lakes Airport, Becker County (Minnesota).

Since the filing of the 'Environmental Assessment Relative to the proposed improvements to the Detroit Lakes Airport' by the Detroit Lakes-Becker County Airport Commission some changes in the plan for roadway relocation have developed. The proposed extension of the 13/31 runway to the southeast requires that the north and south township road, lying between Sections 28-29 and Sections 32-33, Township 139 North, Range 41 West, Detroit Township, be re-routed and that a suitable roadway be provided for traffic flow to

and from the affected areas. This roadway would permit a shorter and more direct connection to the City of Detroit Lakes than the existing connection to State and Federal Highway No. 10. This construction was determined to be beneficial and necessary prior to the contemplated airport expansion as right-of-way was secured. There will be no changes in environmental effects as previously discussed.

EIS-MO-73-0396-D PC$3.75
Federal Aviation Administration, Kansas City, Mo. Airports Div.
MISSISSIPPI COUNTY AIRPORT, CHARLESTON, MISSOURI.
Draft environmental impact statement.
2 Mar 73, 32p ELR-0396

Descriptors: (*Environmental impact statements, *Airports), (*Missouri, Environmental impact statements), Construction, Runways, Air pollution, Aircraft noise, Land acquisition.
Identifiers: Mississippi County Airport, Charleston (Missouri).

Acquisition of land (100 acres) for the development of an airport facility is proposed, including a primary runway 3800' x 75' and crosswind runway (3000'). Slight increases in air and sound pollution will result.

EIS-MO-73-0454-F PC$17.00/MF$0.95
Army Engineer District, St. Louis, Mo.
PROPOSED FOSSIL-FUEL POWER PLANT AT RUSH ISLAND, JEFFERSON COUNTY, MISSOURI.
Final environmental impact statement.
24 Nov 72, 299p ELR-0454
Supersedes report dated Aug 72, EIS-MO-72-5141-D. Prepared in cooperation with Union Electric Co., Bechtel Corp., Westinghouse Environmental Systems, and Harlan Bartholomew and Associates.

Descriptors: (*Environmental impact statements, *Electric power plants), (*Missouri, Environmental impact statements), Licenses, Construction, Structures, Flood plains, Coal, Fossil fuels, Air pollution, Water pollution, Land use.
Identifiers: Jefferson County (Missouri).

The project involves processing of Department of the Army permit under 33 USC 403 for construction of a fossil-fuel power plant and appurtenant structures in and along the Mississippi River. Environmental impacts include conversion of approximately 150 acres of flood plain land to industrial use, loss of public access route, release of products of combustion and waste heat to the environment, consumption of approximately 2.5 million tons of coal per year. Adverse environmental effects include increase in concentrations of sulfur dioxide, nitrogen oxides and particulate matter in the atmosphere, loss of some fish on plant intake screens, and loss of fish eggs and larvae carried through cooling system.

EIS-MO-73-0507-F PC$3.75/MF$0.95
Federal Aviation Administration, Washington, D.C. Airports Service.
MANSFIELD MUNICIPAL AIRPORT, MANSFIELD, MISSOURI.
Final environmental impact statement.
12 Jan 73, 35p ELR-0507
Supersedes report dated Dec 72, EIS-MO-72-5706-D.

Descriptors: (*Environmental impact statements, *Airports), (*Missouri, Environmental impact statements), Land acquisition, Construction, Runways, Aviation lighting.
Identifiers: *Mansfield (Missouri), Mansfield Municipal Airport, Wright County (Missouri).

The project proposed acquisition of additional land for airport improvement, including a runway 3000' x 50' and proposed development needed through 1990. Adverse impacts are slight increases in air pollution and sound levels.

EIS-MO-73-0512-F PC$4.25/MF$0.95
Federal Aviation Administration, Washington, D. C. Airports Service.
PIEDMONT MUNICIPAL AIRPORT, PIEDMONT, MISSOURI.
Final environmental impact statement.
Mar 73, 42p ELR-0512
Supersedes report dated Oct 72, EIS-MO-72-5454-D.

Descriptors: (*Environmental impact statements, *Airports), (*Missouri, Environmental impact statements), Construction, Runways, Taxiways, Aviation lighting, Air pollution.
Identifiers: Piedmont (Missouri), Piedmont Municipal Airport, Wayne County (Missouri).

The project proposes construction of a Stage II, Basic Utility airport with one runway 3200' x 75', taxiway, VASI, and associated developments. The new area will be exposed to minimal levels of air and sound pollution due to aircraft operations.

EIS-MS-73-0541-D PC$3.50
Soil Conservation Service, Washington, D. C.
SOWASHEE CREEK WATERSHED, LAUDERDALE COUNTY, MISSISSIPPI.
Draft environmental impact statement.
Feb 73, 29p ELR-0541, USDA-SCS-ES-WS (Adm-73-1 (D)

Descriptors: (*Environmental impact statements, *Watersheds), (*Mississippi, Environmental impact statements), Conservation, Land development, Flood control, Channel improvements, Multiple purpose reservoirs, Land use.
Identifiers: *Lauderdale County (Mississippi), Sowashee Creek watershed (Mississippi).

Plans are presented for solving water and natural resource problems, such as erosion, sedimentation, flooding, low income, and inadequate recreation facilities, through utilization of conservation land treatment measures, single-purpose floodwater retarding structures, multiple-purpose structure for floodwater retardation and recreation, basic recreation facilities, and channel modifications in the Sowashee Creek Watershed. Lauderdale County and Meridian, Mississippi are particularly affected. There will be some loss of agricultural production, wildlife habitat, and urban land.

EIS-NB-73-0394-D PC$3.00
Federal Aviation Administration, Kansas City, Mo. Airports Div.
MODISETT FIELD, RUSHVILLE, NEBRASKA.
Draft environmental impact statement.
16 Feb 73, 18p ELR-0394

Descriptors: (*Environmental impact statements, *Airports), (*Nebraska, Environmental impact statements), Runways, Land acquisition, Drainage, Pollution.
Identifiers: *Rushville (Nebraska), Modisett Field.

The project calls for construction of 4300' x 150' safety area and 3900' x 50' NNE/SSE primary runway, segmented circle, perimeter fencing along new property lines and safety fencing. Acquisition of approximately 11 acres of land and 7 acres by easement or clear zones; items of seeding, runway marking and installation of drainage structures. Adverse impacts will be an increase in noise and air pollution from airport operations.

EIS-NC-73-0456-D PC$3.50
National Park Service, Atlanta, Ga. Southeast Regional Office.
PROPOSED BOUNDARY ADJUSTMENT MOORES CREEK NATIONAL MILITARY PARK.
Draft environmental impact statement.
Mar 73, 28p ELR-0456, DES-73-14

Descriptors: (*Environmental impact statements, *National parks), (*North Carolina, Environmental impact statements), Boundaries, Revisions, Highways, Relocation, Land acquisition, Eminent domain, Conservation.
Identifiers: Moores Creek National Military Park, *Currie (North Carolina).

Moores Creek National Military Park, at Currie, North Carolina, proposes to make boundary adjustments on the east, west and north sides of the park, to relocate the present state highway around rather than through the park, and to protect and interpret those areas of prime historical importance with the lands acquired. Environmental impacts involve changes in land ownership and use patterns, social and economic hardships upon relocated persons, increased visitor impact, the construction of facilities necessary to interpret the area, and possible closure of upper Moores Creek to navigation.

EIS-NC-73-0463-D PC$5.00
Department of Housing and Urban Development, Greensboro, N.C. Greensboro Area Office.
FIRST WARD URBAN RENEWAL AREA, N.C. R-79, CHARLOTTE, NORTH CAROLINA.
Draft environmental impact statement.
Mar 73, 67p HUD-R04-EIS-73-01-D ELR-0463
Prepared in cooperation with Redevelopment Commission of the City of Charlotte, N.C.

Descriptors: (*Environmental impact statements, *Urban renewal), (*North Carolina, Environmental impact statements), Blighted areas, Central city, Clearing, Development, Land use, Removal.
Identifiers: *Greensboro (North Carolina), *Housing and development research.

The project is a conventional urban renwal program proposing to clear and redevelop 141.7 acres of blighted predominantly residential land, near the central business district of Charlotte, North Carolina. Approximately 37 acres of this land has been cleared and is being used for an expressway nearing completion. The balance of the project will remove 367 substandard structures to make land available for the construction of a new intown residential area for low to middle income people. The project will benefit the social environment by providing much needed low and moderate as well as middle income housing which is close to jobs, shops, health facilities and other needed recreational, cultural, and educational facilities in downtown Charlotte. It will also eliminate slums and blighted conditions which prevail throughout the area and halt the steady economic and social decline. Adverse effects in the project are moderate noise exposure, relocation of businesses and homeowners, and the temporary effects of construction activities. Land use is now predominantly residential although zoned predominantly business. Re-use is proposed for a predominantly residential area with no drastic change in density anticipated.

EIS-ND-73-0506-D PC$5.00
Federal Aviation Administration, Washington, D.C. Airports Service.
GRAND FORKS INTERNATIONAL AIRPORT, GRAND FORKS, NORTH DAKOTA. PURPOSE: AIRPORT LAYOUT PLAN APPROVAL.
Draft environmental impact statement.
6 Mar 73, 57p ELR-0506

Descriptors: (*Environmental impact statements, *Airports), (*North Dakota, Environmental impact statements), Construction, Runways, Terminal facilities, Aviation lighting, Improvement.
Identifiers: *Grand Forks (North Dakota), Grand Forks International Airport, Grand Forks County (North Dakota).

The project proposes improvement at the Grand Forks airport. Additional land acquisition, clear zones, extension of runways, enlargment of the terminal areas, installation of airport lighting, access roads and parking facilities are needed. Noise and air pollution will increase as activity at the airport increases, but will be negligible if airport zoning is adopted.

EIS-NH-73-0486-F PC$14.75/MF$0.95
Corps of Engineers, Waltham, Mass. New England Div.
NEWINGTON GENERATING STATION, UNIT NO. 1, NEWINGTON, NEW HAMPSHIRE.
Final environmental impact statement.
Sep 72, 252p ELR-0486
Supersedes report dated 24 May 72, EIS-NH-72-4530-D.

Descriptors: (*Environmental impact statements, *Electric power plants), (*New Hampshire, Environmental impact statements), Construction, Improvement, Dredging, Fishes, Fossil fuels, Rivers, Plankton, Sewage, Thermodynamic properties, Fly ash, Land use, Effluents.
Identifiers: Piscataqua River, Newington (New Hampshire).

Construction is proposed of a 400 MW oil-fired fossil fuel electric generating station, located on the Piscataqua River, Newington, New Hampshire, including construction of 345KV and 115KV switch-yards; 410 ft. concrete stack; and, intake and discharge structures associated with the plant. Dredging and disposal of approximately 23,500 cubic yards of bottom sediment; and construction of a cofferdam and its subsequent removal involving an estimated 9,000 cubic yards of dumped fill are required. The Newington station will provide an additional economic, safe and dependable source of electrical energy. Long-term effects of the plant operation on the estuarine and marine organisms are not definitely known at this time. Discharge waters may possibly create a thermal blockage or heat shock conditions on migrating fish, and addition of biocides (if approved) may cause some adverse effects in the immediate area of the two plants.

EIS-NJ-73-0490-F PC$12.50/MF$0.95
Army Engineer District, Philadelphia, Pa.
ATLANTIC CITY ELECTRIC COMPANY, B. L. ENGLAND STATION, BEESLEY'S POINT, CAPE MAY COUNTY, NEW JERSEY.
Final environmental impact statement.
Aug 72, 529p ELR-0490
Supersedes report dated 12 Jan 72, PB-205 671-D.

Descriptors: (*Environmental impact statements, *Steam electric power generation), (*New Jersey, Environmental impact statements), Construction, Dredging, Cooling water, Channels (Waterways), Pollution.
Identifiers: *Cape May County (New Jersey), Great Egg Harbor Bay.

A Corps of Engineers permit has been made by the ACE Company to construct and dredge a cooling water intake channel and to lay a discharge pipe in Great Egg Harbor Bay. The work is in connection with the proposed expansion of the existing B. L. England Generating Station, located on the Great Egg Harbor Bay at Beesley's Point, Cape May County, New Jersey. The project will have an effect on air and water quality, produce some noise, and otherwise have some effect on the aesthetics of the area.

EIS-NJ-73-0534-F PC$6.00/MF$0.95
Federal Highway Administration, Trenton, N.J. New Jersey Div.
THE CONSTRUCTION OF A DRAINAGE TRUNK LINE SERVING ROUTES 20 FREEWAY, AND INTERSTATE 80 IN PATERSON, NEW JERSEY.
Final environmental impact statement.
Mar 73, 78p FHWA-NJ-EIS-72-05-F ELR-0534
Supersedes report dated Aug 72, EIS-NH-72-5148-D. Prepared in cooperation with New Jersey State Dept. of Transportation.

Descriptors: (*Environmental impact statements, *Storm sewers), (*New Jersey, Environmental impact statements), Construction, Drains, Interstate highway system, Pipelines.
Identifiers: Paterson (New Jersey).

The project involves the construction of a 66-inch drainage trunk line to serve Routes 20 Freeway and I-80 in Paterson, New Jersey. Route I-80 has been opened to traffic since December, 1971, without a permanent drainage outlet. Storm water runoff from I-80 in the vicinity of the proposed Route 20 interchange is presently conducted through a temporary connection into the combined sanitary and storm water sewer system of the City of Paterson. The 66-inch drainage trunk line will be constructed in conjunction with Section 2B of the Route 20 Freeway and will drain both Routes 20 and I-80 eliminating the existing temporary connection into the Paterson sewer system. Design approvals have been granted for Route 20, but the location of the drainage trunk line requires Section 4 (f) approval because it affects the Society for Usefull Manufactures Historic District, first listed in the National Register in July 1970, and a park within the historic district. Environmental impacts are discussed.

EIS-NM-73-0408-F PC$4.00/MF$0.95
Federal Highway Administration, Santa Fe, N. Mex. New Mexico Div.
S-1110 (2) BAYARD-VANADIUM 1.8 MILES, GRANT COUNTY, NEW MEXICO.
Final environmental impact statement.
Mar 73, 37p FHWA-NM-EIS-72-07-F ELR-0408
Supersedes report dated Nov 72, EIS-NM-72-5625-D. Prepared in cooperation with New Mexico State Highway Dept.

Descriptors: (*Environmental impact statements, *Highways), (*New Mexico, Environmental impact statements), Improvement, Realignment, Eminent domain, Right of way acquisition.
Identifiers: *Grant County (Texas), New Mexico route 356.

The project involves improvement and realignment of 1.8 miles of New Mexico State Road 356 between Bayard and Vanadium. Environmental impacts are the displacement of two mobile homes, one business and several surface facilities of the 'free gold' aluminum recycling operation. One-hundred fifty feet of right of way will be required for length of the project. Air, water and noise pollution will occur during construction. In addition to the 'do nothing' alternative and the upgrading of the existing alignment, neither of which is considered desirable or practicable, three alternative alignments are considered. Engineering constraints determined the selected alternate.

EIS-NM-73-0409-F PC$4.25/MF$0.95
Federal Highway Administration, Santa Fe, N. Mex. New Mexico Div.
NMP F-051-1 (30), POJOAQUE BRIDGE WIDENING, U.S. 64-285, SANTA FE COUNTY, NEW MEXICO.
Final environmental impact statement.
Mar 73, 44p FHWA-NM-EIS-72-08-F ELR-0409
Supersedes report dated 13 Nov 72, EIS-NM-72-5668-D. Prepared in cooperation with New Mexico State Highway Dept.

Descriptors: (*Environmental impact statements, *Highways), (*New Mexico, Environmental impact statements), Highway bridges, Improvement, Bridge approaches, Intersections.
Identifiers: *Santa Fe County (New Mexico), US highway 64, US highway 285.

This is a spot safety project on U.S. 64-285 in Santa Fe County at Pojoaque, New Mexico. Construction will consist of removing the existing southbound lanes bridge over the Rio Nambe and widening the northbound lanes bridge to a width of 112'. Bridge approaches north and south will be included. Total length of construction on U.S. 64-285 will be 1900'. Positive impacts will include the increase in safety and the reduction of nervous tension experienced by motorists when utilizing the facility. Negative impacts will include additional right of way requirements (approximately 2.3 acres). This is a spot safety project. Because of the number and severity of accidents in the area, a do-nothing policy is not considered acceptable.

EIS-NM-73-0459-F PC$4.00/MF$0.95
National Park Service, Santa Fe, N. Mexico. Southwest Region.
POLLUTION ABATEMENT PROJECT, BANDELIER NATIONAL MONUMENT, NEW MEXICO.
Final environmental impact statement.
Mar 73, 40p ELR-0459, FES-73-12
Supersedes report dated 3 Jul 72, EIS-NM-72-4824-D.

Descriptors: (*Environmental impact statements, *Sewage disposal), (*New Mexico, Environmental impact statements), Rebuilding, Water pollution, Abatement, Rivers, Vegetation.
Identifiers: Rio Grande River, Los Alamos County (New Mexico), Sandoval County (New Mexico), *Bandelier National Monument.

The project calls for rehabilitation of the existing sewage disposal system at Bandelier National Monument, Counties of Sandoval and Los Alamos, New Mexico, to eliminate contamination of the Rio Grande River and to include a lift station, 5,200 feet of force main, and 2 sealed sewage lagoons totalling 0.9 acres. The major impact from the proposal will be beneficial, in that it will enhance both the natural and social environment of the monument. Minor and reversible adverse impact will affect vegetation at localized sites.

EIS-NM-73-0481-D PC$3.00
Federal Aviation Administration, Washington, D.C. Airports Service.
UTE LAKE STATE PARK AIRPORT, UTE LAKE STATE PARK, NEW MEXICO.
Draft environmental impact statement.
Mar 73, 19p ELR-0481
Prepared in cooperation with Airports District Office, Albuquerque, N. Mex.

Descriptors: (*Environmental impact statements, *Airports), (*New Mexico, Environmental impact statements), Runways, Construction, Taxiways, Aprons.
Identifiers: Ute Lake State Park Airport, Ute Lake State Park, Quay County (New Mexico).

It is proposed to develop a new basic utility airport for use by small propeller-driven aircraft, including: construct, mark, and light a 5000 ft x 50 ft E/W bituminous surfaced runway; construct bituminous surfaced parking apron and connecting taxiway; construct bituminous surfaced auto parking area and access road; install visual approach slope indicator landing air, segmented circle, lighted wind cone, tiedown anchors and perimeter fencing. The airport will be used by small propeller-driven aircraft. Turbojet traffic is not anticipated due to the short runway length. It is not expected that the proposed project will measurably increase air and water pollution.

EIS-NY-73-0521-F PC$19.25/MF$0.95
Directorate of Licensing (AEC), Washington, D. C.
OPERATION OF JAMES A. FITZPATRICK NUCLEAR POWER PLANT, POWER AUTHORITY OF THE STATE OF NEW YORK, DOCKET NO. 50-333.
Final environmental impact statement.
Mar 73, 345p ELR-0521
Supersedes report dated Nov 72, EIS-NY-72-5631-D.

Descriptors: (*Environmental impact statements, *Nuclear power plants), (*New York, Environmental impact statements), Boiling water reactors, Licenses, Construction, Operations, Fishes, Transmission lines.
Identifiers: *Scriba (New York), Lake Ontario.

The proposed actions are continuation of the construction permit and issuance of an operating license for the James A. FitzPatrick nuclear power plant in the town of Scriba, New York. The plant will utilize a boiling-water reactor with a designed thermal rating of 2436 megawatts to produce 821 megawatts net electrical power and a maximum (stretch) rating of 2557 megawatts thermal (MWt). The condenser cooling will be accomplished by using once-through cooling water drawn from and discharged to Lake Ontario at the rate of 370,000 gallons per minute. A summary is given of environmental impact and effects.

EIS-NY-73-0535-D PC$3.50
Federal Aviation Administration, Washington, D.C. Airports Service.
COLUMBIA COUNTY AIRPORT, HUDSON, NEW YORK.
Draft environmental impact statement.
Mar 73, 29p ELR-0535

Descriptors: (*Environmental impact statements, *Airports), (*New York, Environmental impact statements), Construction, Runways, Taxiways, Aviation lighting.
Identifiers: Hudson (New York), Columbia County Airport.

The proposed expansion will consist of the following: 700 ft x 75 ft runway extension, 1,040 ft x 40 ft parallel taxiway, runway lighting extension, drainage, seeding and power line relocation. The purpose of the proposed expansion is to allow larger aircraft to use the airport facilities. The proposed project will not result in, or cause, any primary or secondary consequence on the environment, either human or natural but will affect the ambient noise level somewhat.

EIS-OH-73-0497-F PC$5.25/MF$0.95
Federal Highway Administration, Columbus, Ohio. Ohio Div.
HARDIN COUNTY, U.S.R. 30S, AND U.S.R. 68 RELOCATION (BYPASS, CITY OF KENTON, OHIO).
Final environmental impact statement.
Mar 73, 62p FHWA-OHIO-EIS-72-13-F ELR-0497
Supersedes report dated 3 Apr 72, PB-207 917-D. Prepared in cooperation with Ohio State Dept. of Transportation.

Descriptors: (*Environmental impact statements, *Highways), (*Ohio, Environmental impact statements), Belt highways, Farm land, Bypasses, Construction, Eminent domain, Land acquisition.
Identifiers: *Hardin County (Ohio), Kenton (Ohio), US highway 30S, US highway 68.

It is proposed to construct a bypass of the city of Kenton, Ohio, Hardin County, for U.S.R. 30S, U.S.R. 68, and S.R. 31 and remove these routes from the highway system through the city of Kenton. Length of the proposed bypass is approximately 8.16 miles and will ultimately provide a four-lane limited access highway. This bypass will reduce noise and congestion in the City of Kenton. The traveling public will benefit from the safety of a new highway. Land use near the interchanges may change from general farming to commercial or industrial. There will be a loss of general farming land for construction of a bypass.

EIS-OH-73-0529-F PC$4.00/MF$0.95
Federal Highway Administration, Columbus, Ohio. Ohio Div.
SU-1638 (1), THE CONSTRUCTION OF THE ST. MARYS SOUTH CONNECTOR.
Final environmental impact statement.
Mar 73, 40p FHWA-OHIO-EIS-72-04-F ELR-0529
Supersedes report dated 8 Feb 72, PB-206 377-D. Prepared in cooperation with Ohio State Dept. of Transportation.

Descriptors: (*Environmental impact statements, *Highways), (*Ohio, Environmental impact statements), Traffic engineering, Construction, Right of way acquisition, Safety, Highway bridges.
Identifiers: Saint Marys (Ohio), Auglaize County (Ohio).

It is proposed to construct a new east-west street across the southern part of the City of St. Marys from Wayne St. eastward to State Route No. 29. The project will increase safety and efficiency of travel in St. Marys, require the acquisition of land for highway purposes requiring the displacement of one family, and include construction of a new bridge over the St. Marys's River and also the Miami and Erie Canal.

EIS-OH-73-0544-D PC$3.00
Federal Highway Administration, Columbus, Ohio. Ohio Div.
THE IMPROVEMENT OF BAGLEY ROAD, COUNTY ROAD 27, AND STATE ROUTE 237 FROM RIVERSIDE ROAD TO EASTLAND ROAD IN THE CITY OF BEREA, CUYAHOGA COUNTY, OHIO.
Draft environmental impact statement.
Mar 73, 15p FHWA-OHIO-EIS-73-2-D ELR-0544
Prepared in cooperation with Cuyahoga County Engineer.

Descriptors: (*Environmental impact statements, *Highways), (*Ohio, Environmental impact statements), Construction, Improvement, Urban areas, Eminent domain.
Identifiers: Berea (Ohio), Cuyahoga County (Ohio), Ohio route 237, Ohio route 27.

The improvement will consist of the widening and reconstruction of Bagley Road, an existing two-lane pavement, on its present alignment. The basic lane setup will be four-lane curbed pavement with a five-lane curbed section being provided through the overlap of State Route 237 from Mulberry Street to Front Street. The proposed right-of-way will be eighty feet for the four-lane section and ninety feet for the five-lane section. The improvement will require the taking of approximately five residences. All normal requirements for dust, erosion control, and protection of the existing natural environment will be enforced during construction to minimize the inconvience to the community.

EIS-OK-73-0461-D PC$3.75
Federal Highway Administration, Oklahoma City, Okla. Oklahoma Div.
F-84, IMPROVEMENTS OF US 271 FROM THE ARKANSAS STATE LINE WESTERLY 1.2 MILES; S-S-4002, IMPROVEMENT OF SH 112 FROM NORTHEAST OF CAMERON NORTHEASTERLY 10.2 MILES IN LEFLORE COUNTY, OKLAHOMA.
Draft environmental impact statement.
Mar 73, 34p FHWA-OK-EIS-73-01-D ELR-0461
Prepared in cooperation with Oklahoma State Dept. of Highways.

Descriptors: (*Environmental impact statements, *Highways), (*Oklahoma, Environmental impact statements), Construction, Relocation, Residential buildings, Farms, Traffic safety.
Identifiers: US highway 271, LeFlore County (Oklahoma).

It is proposed to improve inadequate highway facilities to provide adequate transportation facilities from rural portions of LeFlore County, Oklahoma, to Fort Smith, Arkansas, a regional trade center. The positive effects include improved transportation facilities resulting in increased safety, convenience and savings for the road user, enhanced area economy, and decreased congestion along portions of the existing highways. Adverse effects are reduction of pasture lands and displacement of people and businesses.

EIS-OK-73-0478-D PC$3.25
Federal Aviation Administration, Washington, D.C. Airports Service.
SEQUOYAH PARK AIRPORT, WAGONER, OKLAHOMA.
Draft environmental impact statement.
Mar 73, 21p ELR-0478
Prepared in cooperation with Oklahoma City Airports District Office, Bethany, Okla.

Descriptors: (*Environmental impact statements, *Airports), (*Oklahoma, Environmental impact statements), Runways, Improvement, Aviation lighting, Air pollution.
Identifiers: Sequoyah Park Airport, Wagoner (Oklahoma).

The following is proposed: extend and widen existing runway; widen existing taxiway; enlarge parking apron; install medium intensity runway lights (MIRL); install visual approach slope indicators (VASI-2); construct fence around airport; obstruction removal; construction of access road; future construction of comfort station. Moderate amounts of air pollution are expected, due to anticipated use of propeller-driven aircraft and limited use of business jets, however, surface air currents should disperse the small amounts of pollutants generated. Noise output of the aircraft expected to be using this facility will be minimal.

EIS-OR-73-0485-D PC$17.75
Federal Aviation Administration, Washington, D.C. Airports Service.
AIRPORT MASTER PLAN REPORT, MAHLON SWEET FIELD, PREPARED FOR THE CITY OF EUGENE, OREGON, AND LANE COUNCIL OF GOVERNMENTS.
Draft environmental impact statement.
Aug 72, 313p ELR-0485
Prepared in cooperation with Arnold Thompson Associates, Inc., and Wilbur Smith, and Associates, San Francisco, Calif.

Descriptors: (*Environmental impact statements, *Airports), (*Oregon, Environmental impact statements), Improvement, Construction, Runways, Land use, Wildlife.
Identifiers: *Eugene (Oregon).

Improvement of existing air carrier runways and construction of a new general aviation runway are proposed at Eugene, Oregon. During the useful life of the proposed runway, there will be slight increase in air pollution. Predicted noise contours are not significant. There will be a loss of approximately 35 acres of natural cover for wildlife and the potential for an alteration in the feeding habitats of some waterfowl.

EIS-OR-73-0488-D PC$4.50
Army Engineer District, Walla Walla, Wash.
WILLOW CREEK LAKE, HEPPNER, MORROW COUNTY, OREGON.
Draft environmental impact statement.
Dec 72, 48p ELR-0488

Descriptors: (*Environmental impact statements, *Lakes), (*Oregon, Environmental impact statements), Dams, Flood control, Water supply, Streams, Water quality, Wildlife.
Identifiers: Willow Creek Lake, Morrow County (Oregon).

The proposal is a 155-foot-high dam which would create a lake with a normal maximum size of 224 acres. Also included in the project is 1.5 miles of channel alteration through the City of Heppner. The authorized project purposes include flood control, irrigation, municipal and industrial water supply, water quality control, and provision for sports fishing, wildlife use, and recreation. Total land requirements would be approximately 570

acres. Fishery and wildlife mitigation are included in the project proposal. Major impacts of the project would be the inundation and/or alteration of approximately 4 miles of natural stream channel, reduction of the flood hazard in Heppner, and enhancement of fish and wildlife opportunities. Lake recreation, limited by seasonal water fluctuation, would be provided. Increased irrigation would be possible as a result of the project. Construction of the project would create a lake with a fluctuating water level which would result in the exposure of noticeable expanses of bare shoreline during parts of the year. The project would cause the permanent loss of wildlife habitat along the stream.

EIS-PA-73-0423-D PC$4.50
Soil Conservation Service, Harrisburg, Pa.
OIL CREEK WATERSHED, CRAWFORD, ERIE, WARREN AND VENANGO COUNTIES, PENNSYLVANIA.
Draft environmental impact statement.
Feb 73, 46p ELR-0423, USDA-SCS-ES-WS (Adm)-73-36-D

Descriptors: (*Environmental impact statements, Watersheds), (*Pennsylvania, Environmental impact statements), Flood control, Soil erosion, Water quality, Fishes, Wildlife, Recreational facilities.
Identifiers: Oil Creek Watershed, Crawford County (Pennsylvania), Erie County (Pennsylvania), Warren County (Pennsylvania), Venango County (Pennsylvania).

A watershed protection and flood prevention project for the 112,000 acres in Oil Creek Watershed, Crawford County, Pennsylvania, will be installed by the local sponsoring organizations with federal assistance under Public Law 83-566, as amended. Land treatment measures are planned for 12,585 acres. Six single purpose dams will be built to provide flood prevention. A summary of environmental impact and adverse environmental effects is given.

EIS-PA-73-0457-D PC$5.00
Federal Highway Administration, Harrisburg, Pa. Pennsylvania Div.
A-4952, SECTION 1, RICHLAND AVENUE, YORK COUNTY, PENNSYLVANIA.
Draft environmental impact statement.
Mar 73, 60p FHWA-PA-EIS-73-04-D ELR-0457
Prepared in cooperation with Pennsylvania State Dept. of Transportation.

Descriptors: (*Environmental impact statements, *Highways), (*Pennsylvania, Environmental impact statements), Construction, Central city, Traffic engineering, Right of way acquisition, Recreational facilities.
Identifiers: York County (Pennsylvania).

The project will be a Class I facility providing four lanes for approximately 0.9 mile in the City of York and Spring Garden Township, beginning at Country Club Road and proceeding northwest to College Avenue. As designed, the highway will have a variable right-of-way width of 84' to 126'. This four lane facility will be curbed on both sides to minimize right-of-way acquisition and to control access. It will not have a median barrier allowing free left turn movements. The project does involve some right-of-way acquisition from Odeon Park in the City of York. The present design has no adverse impact on the recreational potential of Odeon Park, but rather, enhances the park by virtue of elimination of an undesirable and polluted stream with the provision of a concrete box culvert to carry this stream underground. The elimination of this natural barrier will provide opportunity for additional access to the park.

EIS-PA-73-0460-D PC$10.75
Directorate of Licensing (AEC), Washington, D.C.
THE BEAVER VALLEY POWER STATION UNIT 1 OF THE DUQUESNE LIGHT COMPANY, OHIO EDISON COMPANY, PENNSYLVANIA POWER COMPANY, DOCKET NO. 50-334.
Draft environmental impact statement.
Mar 73, 175p ELR-0460

Descriptors: (*Environmental impact statements, *Nuclear power plants), (*Pennsylvania, Environmental impact statements), Pressurized water reactors, Construction, Land use, Radioactive Contaminants, Cooling, Gases.
Identifiers: Beaver County (Pennsylvania).

The proposed action is the continuation of construction permit CPPR-75 and the issuance of an operating license to the Duquesne Light Company, the Ohio Edison Company and the Pennsylvania Power Company (the applicants) for the Beaver Valley Power Station Unit 1. A summary of environmental impact and adverse effects include the following: assignment of about 20 acres of natural land for the plant facilities; a visible plume will occur from operation of the cooling tower, however ground level effects are not expected; a small increase in chemical wastes, released to the river; discharges of small quantities of radioactive gases and liquids; to the environment; Creation of a very low probability of accidental radiation risk to nearby residents; possible mortality or sublethal stress on less than 10% of the drift organisms of the river as a consequence of being taken into the condenser cooling water or passing through the heated blowdown discharge plume, and consumption of 14,000 acre-ft of water/yr.

EIS-SC-73-0545-F PC$4.75/MF$0.95
Federal Highway Administration, Columbia, S.C. South Carolina Div.
CONSTRUCTION OF I-77 FROM COLUMBIA TO ROCK HILL, SOUTH CAROLINA.
Final environmental impact statement.
Mar 73, 52p FHWA-SC-EIS-72-01-F ELR-0545
Supersedes report dated 3 Feb 72, PB-206 388-D.
Prepared in cooperation with South Carolina State Highway Dept.

Descriptors: (*Environmental impact statements, *Highways), (*South Carolina, Environmental impact statements), (*Interstate highway system, Environmental impact statements), Construction, Traffic engineering, Eminent domain.
Identifiers: Columbia (South Carolina), Rock Hill (South Carolina), Interstate highway 77, York County (South Carolina), Chester County (South Carolina), Fairfield County (South Carolina), Richland County (South Carolina).

The South Carolina Highway Department, in cooperation with Federal, State, and local government, plans to construct a new highway as a part of the Interstate and Defense Highway System between Columbia and Rock Hill, South Carolina, approximately 60 miles. This should result in improved interstate and intrastate travel; stimulus to economic, residential and recreational growth; displacement of some residents; some soil erosion and siltation of streams and other bodies of water; and introduction of vehicular traffic into a new corridor with its attendent noise and exhaust emissions.

EIS-SD-73-0471-D PC$3.75
Federal Highway Administration, Pierre, S. Dak. South Dakota Div.
F 044-6 DAY COUNTY, SOUTH DAKOTA. FROM WEBSTER, SOUTH DAKOTA EAST TO DAY COUNTY LINE.
Draft environmental impact statement.
Mar 73, 32p FHWA-SD-EIS-73-03-D ELR-0471
Prepared in cooperation with South Dakota State dept. of Highways.

Descriptors: (*Environmental impact statements, *Highways), (*South Dakota, Envirnomental impact statements), Reconstruction, Right of way acquisition, Wildlife.
Identifiers: US highway 12, Day County (South Dakota).

The report describes the proposal for the reconstruction of US Highway 12 from Webster east to the Day County Line in South Dakota. The increase in traveler comfort and safety and the decrease in depreciation on vehicles are positive benefits to be derived from completion of the project. No significant adverse environmental effect is expected to occur because of the reconstruction of the highway facility.

EIS-TN-73-0503-D PC$3.50
Federal Aviation Administration, Washington, D. C. Airports Service.
SOMERVILLE-FAYETTE COUNTY AIRPORT, SOMERVILLE, TENNESSEE.
Draft environmental impact statement.
Mar 73, 29p ELR-0503

Descriptors: (*Environmental impact statements, *Airports), (*Tennessee, Environmental impact statements), Construction, Runways, Taxiways, Aprons, Access roads, Parking facilities.
Identifiers: *Somerville (Tennessee), Somerville-Fayette County Airport, *Fayette County (Tennessee).

The City of Somerville and Fayette County, Tennessee, requested federal funds for land acquisition airport development and clear zones; to construct new north/south runway, apron and stub taxiway, install medium intensity lighting system, windcone and segmented circle; VASI-2, also to construct access road and auto parking; The development will result in construction of a new Basic Utility Stage II airport adequate to accomodate approximately 95 percent of propeller aircraft weighing under 12,500 pounds on a 24-hour basis. There will be approximately 25 AC + of clearing slightly increased intermittent noise levels, due to the operation of single and twin engine propeller-driven aircraft; and slightly increased air pollution due to operations of these aircraft and 'short term' adverse environmental effects associated with normal construction techniques. There were no significant adverse environmental effects associated with the project.

EIS-TN-73-0531-F PC$6.25/MF$0.95
Federal Highway Administration, Nashville, Tenn. Tennessee Div.
STATE PROJECT NUMBER 30002-0211-14, STATE ROUTE 34, F-34-1 ( ), FROM INTERSTATE 81 NEAR MOHAWK, TO WEST END OF THE STATE ROUTE 34 BYPASS OF GREENEVILLE, GREEN COUNTY, TENNESSEE.
Final environmental impact statement.
Mar 73, 85p FHWA-TN-EIS-7208-F ELR-0531
Supersedes report dated 8 May 72, PB-209 048-D.
Prepared in cooperation with Tennessee State Dept. of Transportation.

Descriptors: (*Environmental impact statements, *Highways), (*Tennessee, Environmental impact statements), Construction, Relocation, Eminent domain, Wildlife, Farms.
Identifiers: Green County (Tennessee), Tennessee route 34.

The proposed project is an improvement of the State Route 34 highway link between Interstate Route 81 near Mohawk and the western end of the Greeneville Bypass. Project length ranges from 11.0 to 11.6 miles, depending on which alternate alignment is chosen. The project would have four traffic-carrying lanes throughout its entire length. The exact cross-section would vary with the particular alternate chosen. Residential, industrial, and commercial growth will tend toward more concentration near the new facility. Adverse impacts which will be present regardless of which alternate is chosen are relocation of families and businesses, loss of wildlife habitat for both small and big game, and loss of some productive agricultural land. An analysis of usage of agricultual land

indicates that amounts required for highway right-of-way would not affect productivity in the foreseeable future. There will be no effect on historical sites, recreational land or wildlife refuges.

EIS-TN-73-0538-F PC$4.25/MF$0.95
Federal Aviation Administration, Washington, D.C. Airports Service.
SPARTA-WHITE COUNTY AIRPORT, SPARTA, TENNESSEE.
Final environmental impact statement.
Feb 73, 42p ELR-0538
Supersedes report dated Dec 72, EIS-TN-72-5791-D.

Descriptors: (*Environmental impact statements, *Airports), (*Tennessee, Environmental impact statements), Construction, Runways, Taxiways, Aviation lighting, Access roads, Land use, Aircraft noise.
Identifiers: *Sparta (Tennessee), White County Airport, White County (Tennessee).

The city of Sparta and White County, Tennessee, propose to construct a general utility airport adequate for accommodating substantially all propeller aircraft weighing less than 12,500 pounds. This construction will require a 4000' x 75' runway, a stub taxiway, and a 150' x 300' apron with a medium intensity lighting system. An access road, segmented circle, wind cone, VASI-2, obstruction clearing, and land acquisition are also included. The facility will be useable on a 24-hour basis. There will be 16 acres of clearing; slightly increased air pollution due to operations of these aircraft, and short-term environmental effects associated with normal construction. There will be 130 acres of property acquisition.

EIS-TX-73-0480-D PC$3.00
Federal Aviation Administration, Washington, D.C. Airports Service.
WHARTON MUNICIPAL AIRPORT, WHARTON, TEXAS.
Draft environmental impact statement.
Mar 73, 19p ELR-0480

Descriptors: (*Environmental impact statements, *Airports), (*Texas, Environmental impact statements), Runways, Aviation lighting, Taxiways, Air pollution.
Identifiers: Wharton Municipal Airport, Wharton (Texas).

Administrative approval is proposed of a request for financial assistance to improve Wharton Municipal Airport. The report describes acquisition of land for future southerly runway extension to 5,000 feet and future clear zone, extend existing 3,200 feet runway northerly to 3,800 feet wholly within existing airport property, construct parallel taxiway, expand apron, install Visual Approach Slope Indicator (VASI), fencing, lighting, and nondirectional radio beacon (NDB). There will be a few additional operations by heavy (over 8,000 pounds) twin engine aircraft and a very few by business jet aircraft after completion of the development resulting in a slight increase in noise pollution; however, since there is no one living in the area, there will be no impact. Air pollution from these operations will also slightly increase, but prevailing breezes will rapidly disperse this over large unpopulated areas of farmland and prairie. Water pollution will not increase. On the positive side, a few of the aircraft will no longer contribute to the already high levels of pollution near larger city airports formerly used as termination points. There will also be a savings in resources resulting from less ground travel to former termination points for passenger delivery.

EIS-TX-73-0492-F PC$4.25/MF$0.95
Federal Highway Administration, Austin, Tex. Texas Div.
SH 116 IN HOCKLEY AND LUBBOCK COUNTIES, TEXAS.
Final environmental impact statement.
Mar 73, 43p FHWA-TEX-EIS-72-4553-D ELR-0492
Supersedes report dated 26 May 72, EIS-TEX-72-4553-D. Prepared in cooperation with Texas State Highway Dept.

Descriptors: (*Environmental impact statements, *Highways), (*Texas, Environmental impact statements), Improvement, Divided highways, Eminent domain.
Identifiers: Texas highway 116, Hockley County (Texas), Lubbock County (Texas).

Improvement is proposed of approximately 19.5 miles of SH 116 in Hockley and Lubbock Counties, to provide four travel lanes. All the improved road will be divided highway except for approximately 4.5 miles where right of way is limited. This facility will necessitate relocating seven businesses and twenty-five residences. The proposal could possibly have a slight adverse environmental impact to plants and animal life. This small risk is justified by added safety and efficiency for area motorists.

EIS-TX-73-0495-D PC$18.00
Department of Housing and Urban Development, Washington, D.C. Office of New Communities Development.
SAN ANTONIO NEW TOWN IN TOWN, SAN ANTONIO, TEXAS.
Draft environmental impact statement.
22 Mar 73, 318p HUD-CPM-EIS-73-2D ELR-0495

Descriptors: (*Environmental impact statements, *Municipalities), (*Texas, Environmental impact statements), Urban planning, Community development, Management planning, Monitors.
Identifiers: *New town planning, *San Antonio (Texas).

Land acquisition and land development are proposed over a 20-year period for a new community in the city of San Antonio, Texas. The developer's plan appears properly located for the development of a new-town-in-town for the preservation of environmentally sensitive areas. Management and monitoring programs will insure effective environmental mangement throughout the 20-year development period.

EIS-VA-73-0475-F PC$3.50/MF$0.95
Army Engineer District, Norfolk, Va.
CHINCOTEAGUE INLET NAVIGATION PROJECT, ACCOMACK COUNTY, VIRGINIA.
Final environmental impact statement.
Mar 73, 28p ELR-0475
Supersedes report dated 1 Aug 72, EIS-VA-72-5003-D.

Descriptors: (*Environmental impact statements, *Channels (Waterways)), (*Virginia, Environmental impact statements), Land use, Construction, Pollution, Dredging, Waterways (Transportation).
Identifiers: Chincoteague Inlet, Accomack County (Virginia).

The project proposes to initiate construction, upon Federal authorization and receipt of funds, of a channel approximately 2,600 feet long by 150 feet wide by 12 feet deep across the ocean bar at Chincoteague Inlet. Additional construction would involve a channel 100 feet wide by 9 feet deep from the entrance channel to the presently authorized Chincoteague Channel on the Waterway on the Coast of Virginia, and thence along the channel to a point approximately 2,000 feet north of the State highway bridge at Chincoteague. Most of the interior channel provides sufficient depths and widths to accommodate the above dimensions. Adverse environmental effects are the loss of about 43,000 cubic yards of bottom material and its associated biota and temporary turbidity during channel construction. Loss of approximately 3 acres of low upland terrain which is to be used as a disposal site.

EIS-VA-73-0536-D PC$5.25
Federal Aviation Administration, Washington, D.C. Airports Service.
MOUNTAIN EMPIRE AIRPORT, WYTHEVILLE, VIRGINIA.
Draft environmental impact statement.
Mar 73, 65p ELR-0536

Descriptors: (*Environmental impact statements, *Airports), (*Virginia, Environmental impact statements), Construction, Runways, Taxiways, Aviation lighting, Relocation, Aircraft noise.
Identifiers: Mountain Empire Airport, Wytheville (Virginia).

The proposal includes: Land acquisition; strengthen existing runway (3,000' x 75'); extend runway (1,000' x 75' each end); strengthen apron and stub taxiway; medium intensity runway lighting and miscellaneous. Effects include slight increase in noise, and relocation of one residence.

EIS-VT-73-0426-D PC$4.85
Federal Highway Administration, Montpelier, Vt. Vermont Div.
RECONSTRUCTION ON NEW LOCATION OF 1.8 MILES OF ROUTE VERMONT 100, TO PROVIDE A BYPASS OF THE VILLAGE OF MORRISVILLE, VERMONT.
Draft environmental impact statement.
Mar 73, 99p FHWA-VT-EIS-73-01-D ELR-0426
Prepared in cooperation with Vermont State Dept. of Highways.

Descriptors: (*Environmental impact statements, *Highways), (*Vermont, Environmental impact statements), Reconstruction, Bypasses, Improvement, Traffic engineering, Networks.
Identifiers: Vermont route 100, Morrisville (Vermont), Lamoille County (Vermont).

The proposed project Morristown F 029-1 (2) is located in Lamoille County, Vermont, and comprises reconstruction on new location of 1.8 miles of Route Vermont 100, to provide a bypass of the Village of Morrisville. The highway is to be a 2-lane facility with controlled access. Local route continuity will be maintained by at-grade intersections at four locations through the length of the project. The major effect of the project will be a significant improvement in travel quality in the Morrisville area. Thru traffic will be enabled to bypass present Vermont 100, which is routed thru the downtown commercial area of the village. This diversion will reduce the existing congestion (operation below C level), alleviate the accident rate (presently 5.4 Acc/MVM), and contribute to reduced operating costs as well as enhancement of the amenities of village life.

EIS-WA-73-0487-D PC$7.25
Department of the Navy, Washington, D. C.
THE PROPOSED SANITARY LANDFILL AT BANGOR ANNEX, NAVAL TORPEDO STATION, KEYPORT, WASHINGTON.
Draft environmental impact statement.
Mar 73, 105p ELR-0487

Descriptors: (*Environmental impact statements, *Waste disposal), (*Washington (State), Environmental impact statements), Earth fills, Sanitary engineering, Methodology, Construction.
Identifiers: *Keyport (Washington), Naval Torpedo Station, *Sanitary landfills.

Changing the method of disposal is proposed of 11,000 cubic yards of Puget Sound Naval Shipyard refuse per month from private contractor disposal at the Brem Air dump site to disposal in a proposed Navy sanitary landfill at Naval Torpedo Station, Keyport, Washington. The Navy site consists of 20 acres that would be operated as a sanitary landfill until a county operated disposal area is

operational. No significant permanent impact upon the environment can be foreseen as a result of the proposed action. This proposed action will not significantly affect surrounding property values or water resources. The economic consequences impact favorably upon the U. S. Navy in that there will be a savings to the government over the present method utilizing a privately owned dump site. The private dump site operator will be economically affected through the loss of revenue he currently receives from the U. S. Navy. The proposed project will reduce the contractor dump site operation by 40 percent.

EIS-WA-73-0550-F PC$7.75/MF$0.95
Army Engineer District, Seattle, Wash.
SEATTLE BULK MAIN CENTER, FEDERAL WAY, WASHINGTON.
Draft environmental impact statement.
Mar 73, 113p ELR-0500
Supersedes report dated Mar 73, EIS-WA-73-0363-D.

Descriptors: (*Environmental impact statements, Centers), (*Washington (State), Environmental impact statements), Mail, Facilities, Economic development, Land use, Traffic, Construction.
Identifiers: *Bulk mail system, *Federal Way (Washington), Industrial parks.

The statement presents potential effects of locating a proposed U.S. Postal Service facility at a site in the unincorporated area of Federal Way, south of Seattle, Washington. The site under study is in a 151-acre business park which is part of a 1,600-acre community development. The facility would be one of 21 facilities across the United States comprising a bulk mail system. The land for the Seattle BMC, about 55 acres, and improvements would be owned outright by the U.S.P.S. A more efficient bulk mail system will result in increased economic well-being of the remote western states. A few minor adverse environmental effects are discussed.

EIS-WI-73-0483-D PC$4.00
Federal Aviation Administration, Washington, D.C. Airports Service.
MARSHFIELD MUNICIPAL AIRPORT, MARSHFIELD, WISCONSIN.
Draft environmental impact statement.
Jan 73, 37p ELR-0483
Prepared in cooperation with Wisconsin State Dept. of Transportation, Div. of Aeronautics.

Descriptors: (*Environmental impact statements, *Airports), (*Wisconsin, Environmental impact statements), Runways, Construction, Taxiways, Aviation lighting, Right of way acquisition, Air pollution, Aircraft noise.
Identifiers: Marshfield Municipal Airport, Marshfield (Wisconsin), Wood County (Wisconsin).

The following is proposed: Construct and mark a 1900 ft x 100 ft northwesterly extension to the NW/SE runway; Rebuild, overlay and expand the apron area (360 ft x 220 ft); Construct 30 ft wide taxiway to proposed hangar area; Install medium intensity runway lights on the runway extension and relocate the existing runway end identifier lights; and, Acquire land for airport development and clear zones (approximately 23 acres fee, 4 acres easement). The proposed development will allow use of the airport by larger twin-engine propeller and business jet aircraft, resulting in an increase in noise and air pollution in the immediate vicinity of the airport.

EIS-WV-73-0489-F PC$8.25/MF$0.95
Federal Highway Administration, Charleston, W. Va. West Virginia Div.
BRIDGE APPROACHES TO CHESTER AND US ROUTE 30, CHESTER TO PENNSYLVANIA STATE LINE, HANCOCK COUNTY, WEST VIRGINIA. PROJECTS 3880 (ER-161 ( )) AND 3892 (F-161 ( )).
Final environmental impact statement.
Mar 73, 122p FHWA-WV-EIS-72-03-F ELR-0489
Supersedes report dated Aug 72, EIS-WV-72-5095-D. Prepared in cooperation with West Virginia State Dept. of Highways.

Descriptors: (*Environmental impact statements, *Highways), (*West Virginia, Environmental impact statements), Construction, Improvement, Bridge approaches, Interchanges, Eminent domain, Right of way acquisition, Traffic engineering.
Identifiers: *Hancock County (West Virginia), US highway 30.

The project provides for the continuation of US 30 from the east pier supporting the through truss Ohio River bridge, designated as the Chester-East Liverpool bridge, to the Pennsylvania state line, a distance of approximately 2.8 miles. The proposed highway project is four-lanes with variable width median and partially controlled access. A full interchange in Chester will connect with existing US Route 30. Environmental impacts include the taking of a number of residences with little disruption of the community, the acquisition of 6 businesses, the acquisition of rural land acreage and the replacement of natural slopes with highwall benched cuts, and the taking of land occupied by a privately owned amusement park which has been semi-abandoned for such use. Further impacts include the provision of faster, safer and more efficient transportation.

EIS-WY-73-0439-F PC$4.75/MF$0.95
National Park Service, Omaha, Nebr. Midwest Regional Office.
PROPOSED JOHN D. ROCKEFELLER, JR. NATIONAL MEMORIAL PARKWAY, WYOMING.
Final environmental impact statement.
Mar 73, 52p ELR-0439, FES-73-11

Descriptors: (*Environmental impact statements, *Parkways), (*Wyoming, Environmental impact statements), Highways, Land acquisition, National parks, Traffic, Natural resources, Development.
Identifiers: *Teton County (Wyoming), John D. Rockefeller Jr. National Memorial Parkway.

The National Park Service proposes that a corridor area between Grand Teton and Yellowstone National Parks in Teton County, Wyoming, be designated as John D. Rockefeller, Jr. National Memorial Parkway. In addition, it is proposed that certain connecting roads within these national parks be designated by Secretarial action as Rockefeller Parkway. The proposal involves transfer of Forest Service lands to the National Park Service, designation as a Memorial Parkway, and management of the area as part of the National Park System. Environmental impacts discussed include ecological, social, and economic considerations. Some of the adverse effects are: increased visitation with increased pollution possibilities; restricted use of some motorized vehicles; possible disturbance of some wildlife; and restricted use of some natural resources and development of non-related corridor use facilities.

EUR-4866 PC$3.00/MF$0.95
Interuniversitair Reactor Institutt, Delft (Netherlands). Technische Hogeschool, Delft (Netherlands).
RADIOACTIVITY AND WATER SUPPLIES.
G. Lettinga. 1972, 198p
U. S. Sales only

Descriptors: *Charcoal, *Clays, *Peat, *Radioisotopes, *Water supplies.

For abstract, see NSA 27 06, number 11962.

KFK-1690-UF PC$3.00/MF$0.95
Kernforschungszentrum, Karlsruhe (West Germany).
WATER AND SEWAGE INVESTIGATION IN 1971.
H. Guesten, W. Kluger, W. Koelle, H. Rohde, and H. Ruf. Sep 72, 70p
Lang- In German. U. S. Sales only

Descriptors: *Water supplies.

For abstract, see NSA 27 06, number 14396.

PB-214 946/6 PC$6.00/MF$0.95
Ohio Dept. of Health, Columbus.
LAKE ERIE OHIO, PENNSYLVANIA, NEW YORK INTAKE WATER QUALITY SUMMARY 1970.
Aug 71, 313p
Prepared in cooperation with New York State Dept. of Environmental Conservation, and Pennsylvania Dept. of Environmental Resources.

Descriptors: (*Lake Erie, *Water pollution), (*Plankton, Lake Erie), (*Nutrients, Lake Erie), (*Metals, Lake Erie), Tables (Data), Trace elements.
Identifiers: *Water quality data.

The report summarizes progress to date on a water quality surveillance program being conducted at 22 water treatment intakes in Lake Erie. Water quality data is presented for the following: Nutrients, oxygen-consuming constituents; Heavy metals, cyanide, arsenic, fluoride; Plankton; and Dominant phytoplankton.

PB-215 443/3 PC$4.50/MF$0.95
Steuben County Planning Board, Bath, N.Y.
INTERCHANGE AREA DEVELOPMENT PLANNING.
Final rept.,
Nelson G. Parks. Apr 72, 48p

Descriptors: (*R egional planning, *New York), (*Highways, *Interchanges), Land use, Access roads, Zoning, Frontage roads, Economic development, Vehicular traffic.
Identifiers: *Steuben County (New York).

The report presents a discussion of interchange area planning objectives, interchange area development factors, planning considerations, suggested land use pattern, access control and development road systems. It also presents a discussion of possible development control techniques and an illustrative zoning provision for interchange commercial areas, as well as suggested land use patterns for selected Expressway interchanges in Steuben County. (Author)

PB-215 622/2 PC$3.00/MF$0.95
Environmental Protection Agency, Athens, Ga. Surveillance and Analysis Div.
ENVIRONMENTAL EFFECTS OF PETROCHEMICAL WASTE DISCHARGES ON TALLABOA AND GUAYANILLA BAYS, PUERTO RICO.
Technical study rept.,
M. D. Lair, R. G. Rogers, and M. R. Weldon. Oct 71, 148p TS03-71-208-02

Descriptors: (*Puerto Rico, *Water pollution), (*Tallaboa Bay, Water pollution), (*Guayanilla Bay, Water pollution), Industrial wastes, Chemical industry, Cooling waters, Heat, Metals, Oils, Nutrients, Phytoplankton.
Identifiers: Petrochemical industry, Thermal pollution, *Water quality data.

A water quality study of Tallaboa and Guayanilla Bays, Puerto Rico was conducted March 1 to April 6, 1971 by the Surveillance and Analysis Division, Southeast Region, Environmental Protection Agency. The report presents the findings of this study which characterized and quantified petrochemical wastes and cooling water discharged; determined the effects of these wastes along with cooling water discharges on the quality

and biota in Tallaboa and Guayanilla Bays; and documented violations of Puerto Rico's federal-state coastal water quality standards.

PB-215 696/6 PC-GPO/MF$0.95-NTIS
Tulane Univ., New Orleans, La.
SEWER BEDDING AND INFILTRATION GULF COAST AREA.
Water pollution control research series,
John K. Mayer, Frank W. Macdonald, and Stephen E. Steimle. May 72, 174p EPA-11022-DEI-05/72
Contract EPA-80-04-68
Paper copy available from GPO $1.50 as EP1.16:11022DE1-05/72.

Descriptors: (*Water pollution, Sewers), (*Sewers, *Fluid infiltration), Capitalized costs, Operating costs, Leakage, Construction, Joints (Junctions), Trenching, Foundations, Bentonite, Deltas, Alluvium, Manholes, Water table, Sewer pipes, Ground water, Settlement (Structural), Construction materials, Detection, Measurement.
Identifiers: *Water pollution control, Gulf Coast Region (United States).

Many locations in the southern coast of the United States along the Gulf of Mexico, shown above, experience higher infiltration rates and greater maintenance difficulties with sanitary sewers than other sections of the nation. In addition to pollution costs, excessive infiltration places additional financial burdens on sewerage authorities. Thus a study was conducted of actual sewer systems to obtain and delineate information that will be helpful to those persons engaged in the design, construction, maintenance, and regulation of sewer systems. The purpose of the manual is to present the nature, status and cost of infiltration, methods of measuring infiltration, the causes, measurement and various aspects of sewer settlement, sewer bedding materials, and sewer construction in general and with respect to infiltration control.

PB-215 822/8 PC$21.00/MF$0.95
Tennessee State Planning Commission, Chattanooga. Southeast Tennessee Office.
PARKS, RECREATION AND OPEN SPACE PLAN SOUTHEAST TENNESSEE DEVELOPMENT DISTRICT.
Final rept.
Jun 72, 380p TN-SOUD-3-72-138-1

Descriptors: (*Regional planning, *Tennessee), (*Recreational facilities, Regional planning), Recreation, Objectives, Demand (Economics), Population (Statistics), Trends, Demography, Social welfare.
Identifiers: *Southeast Tennessee Region.

The study is concerned with the recreation facilities and open spaces in nine rural counties of the Southeast Tennessee Development District. Goals and standards are proposed for city and county governments for uniform application in the planning area. A population analysis and economic profile is provided for each county. A county by county report includes an inventory of recreation facilities and an analysis of the potential of nine categories of recreation activity. The study recommends development of facilities according to the standards and a number of acres for each county and city in the nine counties. A regional tour system is also recommended to link the regional park and tourist attractions. (Author Modified Abstract)

PB-215 887/1 PC$6.75/MF$0.95
Walden Research Corp., Cambridge, Mass.
VALIDATION OF IMPROVED CHEMICAL METHODS FOR SULFUR OXIDES MEASUREMENTS FROM STATIONARY SOURCES,
J. Driscoll, J. Becker, R. Hebert, K. Horbal, and M. Young. Nov 72, 258p* EPA-R2-72-105
Contract EPA-68-02-0009

Descriptors: (*Sulfur oxides, *Gas analysis), (*Sulfur dioxide, Gas analysis), (*Air pollution, Sulfur oxides), (*Flue gases, *Gas sampling), Barium organic compounds, Volumetric analysis, Potentiometric analysis, Combustion products, Electric power plants, Accuracy, Tests, Foundries, Paper industry, Iron and steel industry, Smelting, Chemical industry, Lead.
Identifiers: *Air pollution detection, Benzoquinone/ (barium-salt)-dichloro-dihydroxy, Gray iron industry, Sulfuric acid plants.

The principal objective of the research was to validate the following wet chemical methods for sulfur oxides: the barium chloranilate procedure, the barium ion-thorin procedure, and lastly, a simplified method, which is not specific for sulfate, which was also used to analyze aliquots of the SO2 samples. The first phase of the program evaluated the collection and analysis methods. During second phase, the revised chemical methods were tested at uncontrolled coal, uncontrolled oil, and controlled coal-fired power plants. A modification to the program enabled the data collected in the field to be utilized in preparing the national emission standards for sulfur oxides. The results obtained in fossil fuel-fired power plants and in the Walden pilot plant are given in Section 1. Section 2 discusses the results for the other (noncombustion) stationary sources. For each source tested, a brief description of the process is provided. The appendix contains a detailed write-up of the analytical methods used, the Pb titration method developed under this contract and data obtained on solid sorbents for collection of sulfur oxides.

PB-215 920/0 PC-GPO/MF$0.95-NTIS
Franklin Inst. Research Labs., Philadelphia, Pa.
SOLID WASTE MANAGEMENT. ABSTRACTS FROM THE LITERATURE, 1964,
John A. Connolly, and Sandra E. Stainback. 1971, 285p EPA-SW-66
Contract PH-86-67-182, PH-86-68-194
Paper copy available from GPO $2.00 as stock no. EP3.9:M31. Library of Congress Catalog Card No. 53-60514.

Descriptors: (*Waste disposal, Abstracts), Management, Regulations, Financing, Collection, Hauling, Refuse, Agricultural wastes, Composts, Pyrolysis, Incinerators, Industrial wastes, Radioactive wastes, Pesticides, Salvage, Utilization, Automobiles, Earth fills, Public health, Safety, Materials recovery, Bibliographies.
Identifiers: *Solid waste disposal, Water pollution control, Sanitary landfills, Litter.

The bibliography is abstracted and is arranged in categories corresponding to the various administration, engineering, and operational phases of solid waste management. Indices include subject, corporate author, author, and geographical location cited. Addresses of periodical sources are provided in an index.

PB-216 090/1 MF$0.95
San Antonio City Dept. of Planning, Tex. Community Renewal Program.
SAN ANTONIO HISTORIC SURVEY 1972.
Final rept.,
O'Neill, Perez, Lance, and Larcade. Nov 72, 90p

Descriptors: (*Urban planning, *Texas), Surveys, Resources, Protection, Recommendations, Recognition.
Identifiers: *San Antonio (Texas).

The objective of this survey was to provide the City of San Antonio with a useful tool for use in analysis, evaluation, and development of Historic Preservation Planning. The survey results are represented in two separate documents. The first, San Antonio Historic Survey 1972, graphically portrays the City's historic resources and outlines threats of both a traditional and twentieth century nature to their preservation. Specific recommendations for their protection and recognition are made to the San Antonio City Council. The second, the Appendix, includes the survey methodology, a historic preservation law brief, technical data, and bibliography. (Author)

PB-216 106/5 PC-GPO/MF$0.95
Environmental Protection Agency, Rockville, Md. Solid Waste Management Office.
SUMMARIES OF SOLID WASTE RESEARCH AND TRAINING GRANTS - 1970.
Louis W. Lefke, Alvin G. Keene, Richard A. Chapman, and Henry Johnson. 1971, 146p EPA-SW-5r.2 PHS-Pub-1596
Library of Congress Catalog Card No. 74-611512.
Paper copy available from GPO $1.25 as S.N.5502-0030.

Descriptors: (*Waste disposal, Grants), Abstracts, Composts, Meetings, Containers, Agricultural wastes, Hospitals, Incinerators, Diptera, Management planning, Systems management, Biodeterioration, Pyrolysis, Reclamation, Utilization, Safety, Earth fills, Garbage, Pipeline transportation, Plant residues (Organic), Pesticides, Collection, Fluidized bed processing, Materials handling.
Identifiers: *Solid waste disposal, Sanitary landfills, Ocean waste disposal, Phytotoxins.

Research grants are discussed in the following areas: Composts and composting; Conferences and symposiums; Containers; Farm and field wastes; Hospitals; Incineration and incinerators; Insects and insecticides; Planning and management; Phytotoxins; Pyrolysis; Reclamation and reuse; Safety; Sanitary landfill; Sea disposal; Transport; Also discussed are Research grant projects by state and principal investigator; Training grants; and, Research and training grant principal investigators.

PB-216 132/1 PC-GPO/MF$0.95
California State Dept. of Public Health, Berkeley.
CALIFORNIA SOLID WASTE MANAGEMENT STUDY (1968) AND PLAN (1970).
1971, 285p BSWM-SW-2tsg, PHS-Pub-2118
Grant PHS-UI-00008
Library of Congress Catalog Card No. 77-608769.
Paper copy available from GPO $2.50 as EP3-2:C12.

Descriptors: (*Regional planning, Waste disposal), (*California, *Waste disposal), Management planning, Input, Surveys, Agricultural wastes, Industrial wastes, Refuse, Garbage, Collection, Refuse disposal, Earth fills, Environmental surveys, Public health, Water pollution, Air pollution, Land use, Incinerators, Composts, Government policies, Local government.
Identifiers: *Solid waste disposal, Sanitary landfills.

Specific objectives of the study include the following: To determine the quantities and sources of each major type of municipal, industrial, and agricultural solid wastes produced in the state; To document and evaluate existing facilities and methods for handling solid wastes and to determine their potential for continued use; To determine the extent of adverse or beneficial environmental modifications created by present solid waste handling and disposal practices; To identify and evaluate current regulatory controls, policies, and management practices and respective functions of state, county, district, and city jurisdictions relating to solid wastes; To determine the extent and nature of local planning for solid waste management and to evaluate local and regional solid waste master plans.

PB-216 134/7 PC-GPO/MF$0.95-NTIS
District of Columbia Dept. of Sanitary Engineering, Washington.
DISTRICT OF COLUMBIA SOLID WASTE MANAGEMENT PLAN.
Status rept., 1970.

1971, 132P EPA-SW-4tsg
Grant PHS-UI-00030
Paper copy available from GPO $1.25 as stock no. 5502-0029;EP3.2:D63-9/70-C.

Descriptors: (*District of Columbia, *Waste disposal), Management planning, Regulations, Collection, Hospitals, Materials handling, Public health.
Identifiers: *Solid waste disposal.

The report describes the District of Columbia's solid waste collection and disposal situation as it existed at the time of the study. The various problems are analyzed and improvements are recommended.

PAT-APPL-184 828 PC$3.00/MF$0.95
Department of Transportation, Washington, D.C.
A RAILROAD CROSSING SIGNALLING SYSTEM.
Patent Application,
John B. Hopkins. Filed 29 Sep 71, 17p DOT/Case-TSC-10009
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: (*Signal devices, Traffic signals), (*Patent applications, Signal devices), Railroads, Intersections, Warning systems, Microwave communication, Radio telemetry, Remote sensing.

Discussed is a highway-railroad crossing signalling system using microwave telemetry to convey control information from a remote sensing location to a receiver coupled to an active motorist warning device. (Author)

PB-216 161/0 PC$3.75/MF$0.95
California Univ., Los Angeles. School of Architecture and Urban Planning.
THE ROLE OF PSYCHOLOGICAL NEEDS IN MASS TRANSIT.
Final rept.,
Claire Tehan, and Martin Wachs. Dec 72, 32p*
UMTA-CA-11-0009-72-4
Contract DOT-UT-425

Descriptors: (*Mass transportation, *Social psychology), Psychometrics, Reviews, Passenger transportation, Requirements, Public opinion.
Identifiers: Appeal.

Psychological considerations in the planning of urban mass transportation systems are examined. The authors surveyed recent psychological literature to identify a set of basic human needs which might be applied to improve the image and quality of mass transit. These include personal growth needs, such as affiliation, esteem of others, self-identify, and autonomy, and the ego-defensive needs of security, conformity, rejection, and space. Conventional bus operations and two modes of personal rapid transit are evaluated by their satisfaction of passengers' psychological needs. The authors also discuss how a psychologically-oriented approach could be marketed to maximize the attractiveness of public transportation. (Author)

PB-216 162/8 PC$9.00/MF$0.95
Illinois Inst. for Environmental Quality, Chicago.
WASTEWATER TREATMENT TECHNOLOGY. SECOND EDITION.
Final rept.,
J. W. Patterson, and R. A. Minear. Feb 73, 370p*
IIEQ-73-1, IIEQ-20.032
Supersedes report dated Aug 71, PB-204 521.

Descriptors: (*Water pollution, *Industrial wastes), (*Industrial waste treatment, *Reviews), Arsenic, Barium, Boron, Cadmium, Chlorides, Chromium, Copper, Cyanides, Fluorides, Iron, Lead, Manganese, Mercury, Nickel, Oils, pH control, Phenols, Selenium, Silver, Zinc, Cost estimates, Bibliographies.
Identifiers: *Water pollution control, Oil pollution removal, Dissolved solids.

The revised edition is a state-of-art survey of industrial waste treatment literature pertaining to 23 materials found in industrial wastes: arsenic, barium, boron, cadmium, chloride, chromium (hexavalent), chromium (trivalent), copper, cyanide, fluoride, iron (soluble), iron (total), lead, manganese, mercury, nickel, oily wastes, pH control, phenols, selenium, silver, total dissolved solids, and zinc. Information on existing methods of treatment, levels of treatment attainable, and associated costs is presented. (Author)

PB-216 164/4 PC$5.45/MF$0.95
Bergmann (Dietrich R.), Saint Clair Shores, Mich.
DEVELOPMENT OF URBAN PUBLIC TRANSPORTATION SYSTEM STANDARDS AND PROJECT EVALUATION CRITERIA.
Final rept.,
Dietrich R. Bergmann. May 72, 101p*
MICH/BOT-4936-A

Descriptors: (*Urban transportation, *Benefit cost analysis), Commercial transportation, Public utilities, Transportation management, Route surveys, Socioeconomic status, Statistical data, Urban areas, Performance standards.

Part 1 presents seven distinct purposes for urban public transportation services and develops a microscopic approach for their measurement. Forms and costs of public transportation are then reviewed. The sensitivity of manpower costs to changes in institutional arrangements for public transportation services is also reviewed. To augment the material presented primarily in Part 1 an appendix on techniques of discounted benefit-cost analysis is included at the end of the report. Part 2 presents a cost-based hierarchy of public transportation forms for meeting various route or service area performance levels. Socio-economic factors affecting patronage are reviewed. A general approach for developing public transportation service policies or standards in urban traffic corridors is then presented and illustrated. Part 3 presents a brief discussion of the development of public transportation system service standards for an entire urban area. Part 4 completes the report by reviewing general principles for establishing evaluation criteria and priorities among alternative opportunities for financial support of public transportation services. (Author Modified Abstract)

PB-216 166/9 PC$3.75/MF$0.95
Illinois Inst. for Environmental Quality, Chicago.
PRESSURIZED SEWER COLLECTION SYSTEMS.
Final rept.,
Jerold Leckman. Nov 72, 41p* IIEQ-20.027
Prepared in cooperation with McClure-Leckman Engineering, Grayslake, Ill.

Descriptors: (*Sewers, *Sewage pumps), (*Pumping, *Sewage), Sanitary engineering, Hydraulic engineering, Flow rate, Sewer pipes, Grinding (Comminution), Design criteria, Capitalized costs, Operating costs, Reviews, Residential buildings, Recommendations.
Identifiers: Pressure sewers, Grinder pumps.

The report is a review of the current technology of pressurized sewer collection systems using the grinder pump enabling the use of sewers in hilly residential areas where gravity sewers would be difficult to install. Design criteria are given, as well as recommendations for further research and development. Tentative guidelines are set for use in pressurized sewer collection systems.

PB-216 185/9 PC$7.00/MF$0.95
New York State Office of Planning Coordination, Albany.
TOWN OF STILLWATER, NEW YORK. PROPOSED ZONING ORDINANCE.
Final rept.,
Charles Putman. 21 Dec 72, 100p
Prepared in cooperation with Crandell Associate Architects, Glens Falls, N.Y.

Descriptors: (*Urban planning, *New York), (*Land use zoning, Urban planning), Ordinances, Regulations, Land use, Urban areas.
Identifiers: *Stillwater (New York), *Zoning ordinance.

The report describes the recommended zoning regulations that were developed for the Town of Stillwater. (Author Modified Abstract)

PB-216 332/7 PC$9.00/MF$0.95
Teledyne Systems Co., Northridge, Calif.
LORAN C AUTOMATIC VEHICLE MONITORING SYSTEM. VOLUME I: STUDY RESULTS.
Final rept.
Jul 72, 349p* TSC-11164-Vol-1 UMTA-IT-06-0041-72-1
Contract DOT-UT-10012

Descriptors: (*Urban transportation, *Automatic tracking), (*Loran, Urban transportation), Ground vehicles, Systems engineering, Design, Radio communication, Radio equipment, Cost analysis, Ground wave propagation, Buses (Vehicles), Passenger vehicles, Radio tracking, Centralized control, Position finding.
Identifiers: Loran-C, *Automatic vehicle monitoring, *Automatic vehicle location systems.

The report describes baseline system configuration, system design, baseline systems costs, system variations, demonstration equipment, and experimental results. This Automatic Vehicle Monitoring (AVM) application was developed to facilitate the location of fleet vehicles in an urban situation, such as transit buses. LORAN C systems employ LORAN (Long-Range Radio Navigation) transmissions available from a relatively small number of transmitter reference sites. Any given vehicle derives data representative of its position with respect to three of the reference transmitters, and relays this imformation to a central location. The location of the vehicle is then computed. (Author Modified Abstract)

PB-216 396/2 PC$6.00/MF$0.95
Southwestern Illinois Metropolitan Area Planning Commission, Collinsville.
COMPREHENSIVE WATER AND SEWER PLAN, RANDOLPH COUNTY, ILLINOIS.
Dec 72, 426p SWIL-MAPC-72-08
Sponsored in part by the Farmers Home Administration, Champaign, Ill.

Descriptors: (*Water supply, *Illinois), (*Sewers, *Regional planning), Water quality, Management, Economic factors, Land use, Water consumption, Water resources, Evaluation, Improvements, Recommendations.
Identifiers: *Randolph County (Illinois).

The report defines the water and sewer facilities required to meet existing and anticipated future water and sewer needs, while remaining consistent with water quality management principles and regional planning objectives. Part I of the report examines physical conditions, governmental units, and community facilities as well as trends in the county's economy, population and land use. Consideration is also given to water resources and existing water and sewer services available within the county at this time. Part II examines the county's specific water and sewer needs and indicates the improvements needed to each system. Through an evaluation of plan alternatives, recommended water and sewer system improvements are made which will meet existing and projected needs. (Author)96

PB-216 409/3 PC$6.00/MF$0.95
Massachusetts Bay Community Coll., Watertown.
HANDBOOK FOR HOUSING REHABILITATION SPECIALISTS. TECHNICAL APPENDIX.
Rept. for Jan 68-Jul 70,
George C. Rogers, and Frances Olrich. Nov 72, 185p
See also PB-216 408.

Descriptors: (*Residential buildings, Rehabilitation), (*Professional personnel, Specialized training), Handbooks, Neighborhoods, Project planning, Structural design, Problem solving, Mechanical engineering, Standards, Building codes, Trends, Job analysis.
Identifiers: *Housing and urban development, *Rehabilitation specialists.

A textbook is issued for training housing rehabilitation specialists; its training program is published separately as the Rehabilitation Specialist Program. It isthe technical appendix to the report of The Rehabilitation Specialist Program. The Report narrates the development of a training program for housing rehabilitation specialists; the Handbook is a text for use with that curriculum. It deals with issues and principles rather than with procedures or checklists. Local training programs must supplement this material by references to local housing conditions and agency operations. (Author Modified Abstract)

PB-216 410/1 PC$4.00/MF$0.95
New York State Office of Planning Services, Albany.
TOWN OF HOLLAND, ERIE COUNTY, NEW YORK. COMPREHENSIVE DEVELOPMENT PLAN.
Final rept.,
Thomas A. Thomas. Jul 72, 40p
Prepared in cooperation with Herbert H. Smith and Associates, West Trenton, N.J. Rept. no. R-7101-2.

Descriptors: (*Urban planning, *New York), Land use, Residential buildings, Education, Public utilities, Municipalities, Local government, Community development.
Identifiers: *Holland (New York).

The report contains the basic studies for the Comprehensive Plan for the Town of Holland. The specific topics covered are: planning goals and objectives, existing land use, physical features, circulation, housing element analysis, educational facilities, municipal facilities, municipal finance and population. A survey was made of existing conditions and/or facilities; where appropriate, projections for the future were made, and their implications for planning were noted. The volume not only provides a general frame of reference, but provides specific guidelines for the creation of the Comprehensive Plan and its subsequent implementation. (Author Modified Abstract)

PB-216 598/3 PC$3.00/MF$0.95
Newark Coll. of Engineering, N. J.
AN EXTENSION OF THE NEWARK CITY SUBWAY SYSTEM: ITS RIDERSHIP, STATION LOCATION, AND EFFECTS.
Final rept.,
Douglas K. Condon. Nov 71, 58p RWP-101
UMTA-NJ-11-0023-71-2
Contract DOT-UT-236

Descriptors: (*Subway railways, *New Jersey), (*Urban planning, Mass transportation), Feasibility, Improvement, Recommendations, Land use, Railroad stations, Surveys, Environmental impacts, Urban transportation, Demand (Economics).
Identifiers: Newark (New Jersey).

The purpose of the report was to investigate the feasibility and impact of an extension to the existing City Subway System with reference to ridership, land use, station location, and other effects. The existing system and its development history are reviewed in detail. Alignment and corridor determination of the proposed subway extension are also discussed. Survey data were used to develop preliminary ridership estimates for the subway extension. Present land use and demand are reviewed, and the report presents calculations of future trip generation and auto diversion in the study corridor. Tentative station locations are described as reference points for land use and other impacts. Adverse and beneficial effects of the subway extension are summarized with reference to automobile and bus usage. (Author)

PB-216 599/1 PC$3.00/MF$0.95
Illinois Univ., Chicago. Dept. of Systems Engineering.
A COMPUTER SYSTEM FOR INTERACTIVE ANALYSIS AND PLANNING OF URBAN AND TRANSPORTATION SYSTEMS.
Final rept.,
Yehuda Gur. May 72, 53p RR-2 UMTA-IL-11-0024-72-2

Descriptors: (*Mass transportation, Mathematical models), (*Urban planning, Mass transportation), Computerized simulation, Central processing units, Computer systems programs, Computer systems hardware, Interpreters, Transformations, Display devices, Data processing.
Identifiers: *INTRANS (Interactive Transportation Analysis Systems), *Interactive transportation analysis systems, IBM 370 computers.

The paper describes the Interactive Transportation Analysis System, INTRANS. INTRANS is a man-computer interactive graphics system designed to serve transportation and urban planners. Presently, INTRANS is being used mainly for analysis of spatial data. Its major use in the future will be as a skeleton for interactive planning models. INTRANS operates in the Computer Center of the University of Illinois at Chicago Circle, and it uses an IBM 370 as the central processor. The paper defines the need for interactive graphics in planning, the areas where its use is likely to be effective, and the major problems in its implementation and use. The design of INTRANS is described along with its major elements and applications. The paper concludes with a description of plans for development, both for the near and far future. (Author)

PB-216 600/7 PC$6.00/MF$0.95
Montana State Highway Commission.
ROAD DESIGN MANAGEMENT RESEARCH PROJECT. APPENDIX.
Final rept.,
Roy E. Jorgensen. Dec 71, 348p
Prepared in cooperation with Jorgensen (Roy) and Associates, Gaithersburg, Md. Sponsored in part by Department of Transportation, Washington, D.C. See also PB-213 748.

Descriptors: (*Highways, Design), (*Civil engineering, Montana), Management engineering, Manpower utilization, Land surveys, Right of way acquisition, Construction materials, Design criteria, Personnel development, Salary administration.
Identifiers: *Design management.

A road design management research project was initiated to (1) design and apply research techniques directed toward improving manpower utilization, work systems and total management systems of road design functions, and (2) test the techniques in the Montana Department of Highways. The scope of the project was limited to the road design function. The work processes of the planning, programming, location, surveying, right-of-way, materials testing and construction functions were explored only so far as such explorations were essential to completing the work systems improvements in the road design function. Work was initiated in August 1970 and completed in December 1971. During this time an integrated design management system was developed and significant portions tested. The major areas of development included a work system, organization, scheduling and controlling system, personnel classification and salary system and training program. Two manuals were developed -- a management manual documenting the operational characteristics of the integrated system and a design manual documenting design criteria to be used in road design. (Author)

PB-216 601/5 PC$3.00/MF$0.95
Nebrasda Univ., Lincoln. Dept. of Civil Engineering.
A SIMULATION OF THE EFFECTS OF DYNAMIC WATER PRICING POLICIES.
Completion rept. Jul 71-Jun 72,
Marshall Gysi. Jun 72, 27p* W73-06021, OWRR-A-023-NEB (1)

Descriptors: (*Water supply, Stochastic processes), (*Water consumption, *Rates (Costs)), Prices, Computer programs, Mathematical models, Risk, Reservoirs, Supply (Economics), Demand (Economics), Digital simulation.
Identifiers: *Water pricing policies, Water rates.

The effect of time-varying water prices on the long-run risk of water shortages is studied. A digital simulation model for a hypothetical residential community with a stochastic water supply forms the basis for the study. Prices are allowed to vary as a function of reservoir level, generally rising as reservoir levels fall, although decreasing and constant rates are also tested. These tests suggest that the currently popular declining block rate used by most water utilities is not only poor from a community benefit and social equity standpoint, but is also the poorest from the standpoint of risk of shortages. Varying the price of water in order to reflect its relative value has the greatest effect on reducing the risks of shortages. The model's results are valid for any community with a downward sloping water demand curve. (Author Modified Abstract)

PB-216 604/9 PC-GPO/MF$0.95-NTIS
Research Triangle Inst., Durham, N.C.
FLUIDIZED BED CLARIFICATION AS APPLIED TO WASTEWATER TREATMENT,
John C. Orcutt. Dec 72, 100p W73-06037, EPA-R2-72-032
Contract DI-14-12-912
Paper copy available from GPO $1.50 as EP1.23/2:72-032.

Descriptors: (*Sewage treatment, *Coagulation), (*Sludge, *Precipitation (Chemistry)), (*Clarification, sewage treatment), Flocculation, Thickening, Settling, Aluminum sulfate, Iron chlorides, Silicon dioxide, Process variables, Alums, Separation, Colloids, Phosphorus, Chemical removal (Sewage treatment).
Identifiers: *Sludge treatment, *Sludge blanket clarification.

An experimental study of the application of a fluidized sludge blanket clarifier to the coagulation and separation of wastewater solids was made to determine the effects of controlled process variables on the treatment achieved. Experiments using alum and ferric chloride coagulants were carried out in 12- and 24-inch diameter columns by systematic variation of wastewater pH, coagulant dose, upflow fluid velocity, and blanket depth. The results were analyzed using regression analysis techniques and empirical relationships were derived relating the variables to the removal of suspended solids, total organic carbon, phosphorus, and coagulant metal ions. The sludge production rate was also correlated empirically with the operating variables. Both alum and ferric chloride were found to be effective coagulants. The sludge blanket acted as an efficient clarifier up to at least 15 ft/hr superficial velocity, although best removal efficiencies were achieved at lower rates. (Author Modified Abstract)

PB-216 605/6 PC-GPO/MF$0.95-NTIS
California Univ., Berkeley. Sanitary Engineering Research Lab.
CALCIUM PHOSPHATE PRECIPITATION IN WASTEWATER TREATMENT,
Arnold B. Menar, and David Jenkins. Dec 72, 100p SERL-72-6 W73-06038, EPA-R2-72-064
Paper copy available from GPO $1.50 as EP1.23/2:72-064.

Descriptors: (*Chemical removal (Sewage treatment), *Phosphorus), (*Precipitation (Chemistry), Phosphorus), (*Sewage treatment, Chemical removal (Sewage treatment)), Calcium phosphates, Magnesium hydroxides, Calcium carbonates, pH, Settling, Flocculation, Colloids, Solubility, Crystal growth.
Identifiers: *Water pollution control.

Precipitation of calcium phosphate from both synthetically derived wastewater and from actual wastewater was investigated. An amorphous tricalcium phosphate was the steady state solid phase that controlled dissolved phosphate residuals. The solubility of this phase determined from chemically defined systems was used with success to predict dissolved phosphate residuals from both chemically defined systems and actual wastewaters. Suspension settling was enhanced by magnesium hydroxide precipitation but not by calcium carbonate precipitation. In wastewater of moderate alkalinity and hardness, a phosphate removal in excess of 80% was consistently achieved at pH 9.5 with lime doses of at the most 200 mg/l as calcium carbonate. The overall phosphate removal performance was dictated by the performance of the precipitation reactor and its ensuing sedimentation basin. Phosphate containing particles that escaped sedimentation could not be removed by filtration because they dissolved rapidly during the recarbonation process that necessarily precedes the filtration step.

PB-216 606/4 PC$3.00/MF$0.95
Louisiana Office of State Planning, Baton Rouge.
GOALS FOR LOUISIANA PRIORITIES FOR ACTION.
Rept. no. 2 (Final).
1972, 13p

Descriptors: (*Regional planning, *Louisiana), Crimes, Control, Economic development, Education, Health, Environments, Parks, Recreational facilities, Local government, State government, Transportation.

The Report summarizes attainable priorities selected by nine Goals for Louisiana citizen action committees for implementation effort during 1972. Objectives cited are in the areas of Crime Control; Economic Development; Education; Environment; Health; Human Needs and Resources; Parks, Recreation and Tourism; State and Local Government; and Transportation. (Author)

PB-216 623/9 PC$3.00/MF$0.95
Planners Collaborative, Syracuse, N. Y.
SUBDIVISION REGULATIONS: TOWN OF NELSON, MADISON COUNTY, NEW YORK.
Final rept.,
Dec 72, 17p PLANCOLAB-108
Prepared in cooperation with the Nelson Town Planning Board, N. Y. Rept. no. 7106.

Descriptors: (*Urban planning, *New York), (*Land use, *Regulations), Land development, Standards, Sites, Policies.
Identifiers: *Nelson (New York), Subdivision regulations.

The regulations will control land development practices within the town. These regulations establish procedures to be followed in the subdividion of land, and prescribe standards for the development of building sites. (Author)

PB-216 624/7 PC$5.25/MF$0.95
Lake Champlain-Lake George Regional Planning Board, N.Y.
OVERALL PROGRAM DESIGN FOR THE LAKE CHAMPLAIN-LAKE GEORGE REGIONAL PLANNING BOARD.
Final draft,
Donald R. Odell. Dec 72, 65p

Descriptors: (*Regional planning, *New York), Education, Publicity, Project planning, Recommendations.
Identifiers: Lake Chaplain, Lake George, *Clinton County (New York), *Essex County (New York), *Hamilton County (New York), *Warren County (New York), *Washington County (New York).

The report analyzes problems, opportunities, goals and objectives for the Lake Champlain-Lake George region. The regional planning recommends a three tier program of plan preparation and studies, education and public information and implementation to best attempt meeting the goals and objectives. The report contains chapters on Problems, Goals, Objectives, a Program Organization primarily for Board members and constituent county legislatures, Program Direction: A Three Year Overview (which reviews the next three years in summary form, Phase V (1973-74) work program, and Program Analysis by categories using the HUD formula. (Author)

PB-216 633/8 PC$4.50/MF$0.95
Tennessee State Planning Commission, Nashville.
ZONING CODE MADISONVILLE, TENNESSEE.
Final rept.
May 72, 47p TN-MADE-2-72-138-3
Prepared in cooperation with Madisonville Regional Planning Commission, Tenn.

Descriptors: (*Urban planning, *Tennessee), (*Land use zoning, Urban planning), Ordinances, Regulations, Urban areas, Land use.
Identifiers: *Madisonville (Tennessee), *Zoning ordinance.

The document describes a zoning code dividing the municipality into districts so as to regulate the location, height, bulk, and size of buildings and other structures; the percentages of the lot which may be occupied; the sizes of yards, courts, and other open spaces; the density of population; and the uses of buildings, structures and land for trade, industry, residence, recreation, public activity and other purposes. (Author)

PB-216 634/6 PC$4.75/MF$0.95
McLean County Regional Planning Commission, Bloomington, Ill.
TERMINAL AND TRANSFER FACILITIES.
Final rept.,
Dec 72, 53p Technical paper-9
Prepared in cooperation with Federal Highway Administration, Washington, D. C., and Illinois Div. of Highways, Springfield. Report on McLean County Urbanized Area Transportation Study.

Descriptors: (*Regional planning, *Illinois), (*Terminal facilities, Transportation management), Parking facilities, Central city, Airports, Railroads, Forecasting, Bus lines, Cargo transportation.
Identifiers: *McLean County (Illinois).

A major input to the effectuation of the McLean County Transportation Study is the completion of a Terminal and Transfer Facilities Inventory and Forecast Report. By definition of the author , terminal and transfer facilities are those facilities located at the origin and destination of all trips involving the movement of people and goods, which provide for loading and unloading operations and may provide for storing the transportation equipment. Since a trip is considered to end when a transfer is completed from one transportation mode to another, facilities for such transfers are included in the above definition. The content of the report includes inventories and analyses of truck and passenger car parking, public transit, railroads and airports. Parking facilities are discussed in considerable detail for those sections that are most congested in the study area. These sections are as follows: Bloomington Central Business District, Normal Central Business District, and the Illinois State University Main Campus Area. A summary of the inventoried parking space availability and the forecasted parking space demand has been assembled. (Author)

PB-216 635/3 PC$8.50/MF$0.95
Florence Planning Commission, Ala.
RECONNAISSANCE SURVEY: FLORENCE, ALABAMA.
Final rept.
Jul 72, 126p ALA-FPC-0640-1009-01

Descriptors: (*Urban planning, *Alabama), Reviews, Community development, Natural resources, Land use, Economic conditions, Demography, Facilities.
Identifiers: *Florence (Alabama), *Housing and urban development.

A preliminary review is made of the physical, social, economic, and governmental conditions in Florence. The purpose of this report is to provide a basis for the programming of the technical planning work necessary in the development of the Florence Plan. (Author)

PB-216 639/5 PC$6.75/MF$0.95
San Diego County Comprehensive Planning Organization, Calif.
WATER DISTRIBUTION AND SANITARY SEWERAGE SYSTEMS BACKGROUND AND POLICY STUDY. COMPREHENSIVE PLANNING ORGANIZATION. SAN DIEGO COUNTY, CALIFORNIA.
Technical rept. (Final).
Feb 72, 95p CPO-WSBPS-2800-T

Descriptors: (*Regional planning, *California), (*Water distribution, Regional planning), Sewage, Policies, Sewage disposal, Sanitary engineering, Water quality, Maps.
Identifiers: *San Diego County (California).

The Technical Report provides an up-to-date inventory of water distribution and sanitary sewerage agencies of the San Diego Region, of California. (Author)

PB-216 727/8 PC-GPO/MF$0.95-NTIS
Texas Univ., Austin. Center for Research in Water Resources.
DESIGN GUIDES FOR BIOLOGICAL WASTEWATER TREATMENT PROCESSES.
Water pollution control research series,
Joseph F. Malina, Jr., Rolf Kayser, W. W. Eckenfelder, Jr., Ernest F. Gloyna, and W. R. Drynan. Aug 71, 126p EPA-11010-ESQ-08/71
Paper copy available from GPO $1.75 as EP1.16:11010ESQ-08/71.

Descriptors: (*Sewage treatment, Design criteria), Activated sludge process, Aerobic processes, Trickling filtration, Lagoons (Ponds), Anaerobic processes, Clarification, Temperature, Flow rate, Biochemical oxygen demand, Nitrification, Nitrobacter, Nitrosomonas, Mathematical models, Chemical removal (Sewage treatment).
Identifiers: *Water pollution control, Aeration ponds, Anaerobic lagoons, Denitrification.

The report provides a set of guidelines for the design of biological processes for the treatment of municipal wastewater. The equations and factors which must be considered in the design of the activated sludge system, the contact stabilization system, trickling filter plants, aerated lagoons, and waste stabilization ponds are identified. The applicability and limitations of each system and mathematical model of each process are established. Operating data from treatment plants where sufficient applicable data were recorded were used to develop rate constants and other coefficients required for application of the mathematical models and other design of treatment plants. The significant design considerations are discussed, design procedures are outlined and design calculations are developed.

PB-216 802/9 PC$3.00/MF$0.95
Florida Univ., Gainesville. Water Resources Research Center.
A SOCIOLOGICAL PERSPECTIVE OF WATER CONSUMERS IN SOUTH FLORIDA HOUSEHOLDS.
Completion rept.,
George A. Watkins. 4 Sep 68, 100p WRRC-Pub-18 W73-06019, OWRR-A-010-FLA (5)
Contract DI-14-01-0001-1077

Descriptors: (*Water services, *Sociometrics), (*Water consumption, *Florida), Family relations, Attitudes, Water conservation, Socioeconomic status, Correlations, Factor analysis.
Identifiers: Water use, Household practices, *West Palm Beach (Florida), *Homestead (Florida).

In residential households, the relationships between water consumption and certain demographic and social characteristics were determined. The relationships between selected socioeconomic variables, household demographic consumption, and household applicance inventories were developed. Some basic relationships between the use of water and the several socio-economic characteristics of the households of West Palm Beach and Homestead, Florida were established.

PB-216 808/6 PC$3.00/MF$0.95
Clemson Univ., S.C. Water Resources Research Inst.
APPLICATION OF A DIGITAL HYDROLOGIC SIMULATION MODEL TO AN URBANIZING WATERSHED.
Completion rept. Jul 71-Jun 73,
James R. Hendricks, Jr., and James T. Ligon. Jan 73, 87p WRRI-35 W73-06028, OWRR-A-024-SC (2)
Contract DI-14-31-0001-3541

Descriptors: (*Watersheds, *South Carolina), (*River basins, *Economic models), Computer programming, Digital simulation, Hydrologic cycle, Water flow, South Carolina.
Identifiers: *OPSET simulation model, Reedy River basin, *Greenville (South Carolina).

The study examined an urbanizing watershed, the Reedy River basin near Greenville, South Carolina. The objective was to determine certain hydrologic characteristics of the basin using available data and to investigate changes brought about in these characteristics by the process of urbanization. A self-calibrating version of the Stanford Watershed Model named OPSET was applied to the Reedy River data. To investigate changes in the hydrologic characteristics, parameters were estimated for a rural watershed comparable to the Reedy River basin in size and configuration. Two applications were used to investigate the effects of precipitation and diversions on the OPSET-estimated parameters.

PB-216 836/7 PC$12.50/MF$0.95
Mitre Corp., McLean, Va.
SYMPOSIUM ON ENERGY, RESOURCES AND THE ENVIRONMENT. SALINES DE CHAUX CONFERENCE CENTER ARC-ET-SENANS, FRANCE. MAY 12-14, 1972.
12 Apr 72, 507p* M72-154-Rev-1
See also report dated 12 Apr 73, PB-213 037.

Descriptors: (*Energy, *Meetings), Proceedings, United States, Europe, Pollution, Nuclear energy, Forecasting, Natural resources, Economic factors, Sociology, Social change, Fuels, Electric power generation.
Identifiers: Plowshare operation.

The report provides a transcript of the proceedings of the Symposium on Energy, Resources, and the Environment (ERE) sponsored by The MITRE Corporation in conjunction with the Delegation a l'Amenagement du Territoire et de l'Action Regionale (DATAR). The meeting was held on May 12, 13, and 14th at the Saline des Chaux Future Research Conference Center, Arc-et-Senans, France. The symposium format featured six panels as follows: The Contexts for the Conference; International ERE Issues; Plowshare Opportunities and Potential; ERE Interrelationships; European ERE Overview; as well as a session devoted to a general summary and discussion. This Symposium allowed an exchange of information and ERE perspectives between participants from the United States and from Western European countries. (Author Modified Abstract)

PB-216 960/5 PC$6.50/MF$0.95
Regional Planning Council, Baltimore, Md.
PAYING FOR OPEN SPACE. A METHOD AND ANALYSIS.
Final rept.,
Natalie Lobe, William Gosnell, and Elaine Gerber. Jun 72, 88p BTL-RPC-PYNGFOS-6-72

Descriptors: (*Regional planning, Public land), (*Public land, Financial management), Cost estimates, State government, Local government, Taxes, Maryland.
Identifiers: Open space.

This report develops a method for fiscal analysis of elements in the Suggested General Development Plan and applies the method to the Open Space element of the Plan. The analysis schedules costs of the open space plan over a twenty year period and projects the future funding from federal, state and local governments. (Author)

PB-216 999/3 PC$3.50/MF$0.95
Tompkins County Planning Dept., Ithaca, N.Y.
PRELIMINARY POLICIES PLAN. COMPREHENSIVE PLAN STUDIES TOMPKINS COUNTY.
Jun 72, 30p TCDP-1-1

Descriptors: (*Regional planning, *New York), Project planning, State government, Local government, Objectives.
Identifiers: *Tompkins County (New York).

The report represents the initial stages of the formulation of a policies plan as part of the comprehensive plan development. The report includes the conceptual relationships of a policies plan, methodology, decision-making organizational structure at the county level and the interactions at the local level. Preliminary goal statements and partial formulation of functional area objectives are presented. (Author)

PB-217 000/9 PC$7.25/MF$0.95
New York State Office of Planning Services, Albany.
COMPREHENSIVE MASTER PLAN. TOWN OF HOLLAND, ERIE COUNTY, NEW YORK. VOLUME 3. IMPLEMENTATION.
Final rept.,
Thomas A. Thomas. Jun 72, 104p
Prepared in cooperation with Herbert H. Smith Associates, West Trenton, N. J. Rept. no. R-7101-3.

Descriptors: (*Urban planning, *New York), (*Land use zoning, Urban planning), Regulations, Ordinances, Urban areas.
Identifiers: *Holland (New York), Erie County (New York).

The report contains a proposed revised zoning ordinance, a proposed mobilehome ordinance and a proposed land subdivision ordinance for the Town of Holland. The regulations are designed to implement the Comprehensive Master Plan - Volume 2 of this series. (Author)

PB-217 104/9 PC$4.25/MF$0.95
Slash Pine Area Planning and Development Commission, Waycross, Ga.
GOVERNMENTAL SERVICES ANALYSIS FOR ATKINSON COUNTY, GEORGIA.
Final rept.
15 Feb 73, 44p LGSA-1002273-1 CPA-GA-04-04-1002

Descriptors: (*Local government, Regional planning), (*Regional planning, *Georgia), Surveys, Inventories, Performance evaluation, Standards, Comparison, Recommendations, Requirements.
Identifiers: *Atkinson County (Georgia).

The study inventories and analyzes the existing governmental services in Atkinson County, and compares them with existing standards. The report then puts forth various recommendations for the improvement of these services.

PB-217 122/1 PC$9.00/MF$0.95
International Road Federation, Washington, D.C.
1972 WORLD SURVEY OF CURRENT RESEARCH AND DEVELOPMENT ON ROADS AND ROAD TRANSPORT.
Annual rept.
Dec 72, 385p*
Contract FH-11-7656
See also report dated Dec 71, PB-206 728.

Descriptors: (*Roads, Development), (*Highway transportation, *Foreign countries), Research, Classifications, Bibliographies, Freeways, Highway bridges, Stress corrosion, Foundations, Fatigue (Materials), Abstracts, Surveys, Projects, Organizations, Control, Soil mechanics.

The 1972 annual world survey of research and development on roads and road transport reports on current studies in 69 countries excluding the United States. A total of 2,329 studies are reported with a brief abstract. The studies are classified by country and by technical subject area. Two special indepth studies are included: one concerns design and operational experience on high-speed freeways, and the other concerns fatigue-failure and stress-corrosion problems in bridges.

PB-217 359/9 PC$6.50/MF$0.95
North Carolina State Dept. of Administration, Raleigh. State Planning Div.
CRITICAL ENVIRONMENTAL AREAS OF NORTH CAROLINA.
Final rept.,
Richard R. Wilkinson, and R. Paul Darst. Jul 72, 90p State Planning-146.10

Descriptors: (*Regional planning, *North Carolina), (*Environmental surveys, Regional planning), Urbanization, Air pollution, Water pollution, Floods, Storms, Land use.

The project examines the basic uses of North Carolina's environment. Prime lands for agriculture, forestry, wildlife management, recreation, scenic value, waters for commercial and sport fishing, and areas of scientific, cultural, and historic significance are delineated on the maps. Each of these uses is considered valuable to the overall well being of the State. Each function also requires intensive management to maintain the environment in a condition suitable for that use. The basic uses of the land are critical from an environmental, economic, aesthetic, and cultural standpoint. The impact on them from urbanization is a serious threat to their continued functioning. The project explores this impact and the nature of its deteriorating influence as well as the areas of most serious impact. (Author)

PB-217 515/6 PC$3.50/MF$0.95
Genesee County Planning Board, Batavia, N.Y.
GENESEE COUNTY PROGRAM 72. LOCAL GOVERNMENT COOPERATION.
Final rept.
Nov 72, 26p GCPB-72-01
Prepared in cooperation with Kendree and Shepherd Planning Consultants, Inc.

Descriptors: (*Regional planning, *New York), (*Local government, Regional planning), Interviews, State government, Municipalities, Waste disposal, Snow removal.
Identifiers: *Genesee County (New York).

The intent of the report is to introduce the concept of intergovernmental cooperation to the citizens of Genesee County. Approximately seventy-one interviews were conducted with appropriate local, county, and state officials in order to identify which municipal services might benefit by intergovernmental cooperation. Two areas of municipal service, snow control and solid waste disposal, are examined in greater detail. Variations in the provision of these services are suggested. These methods would result in a substantial cost reduction thereby directly benefitting the County taxpayer. The creation of a County Steering Committee to investigate all governmental functions in the County and the development of a series of informational meetings throughout the County in order to educate the public, especially public officials, is recommended. (Author)

PB-217 518/0 PC$3.00/MF$0.95
System Development Corp., Santa Monica, Calif.
DESIGN MANUAL FOR TRAFFIC SIGNAL CONTROL OF DIAMOND INTERCHANGE COMPLEXES.
Technical memo,
P. K. Munjal, J. A. Nemeczky, and J. F. Torres.
Jun 72, 75p* SDC-TM-4601 007/03
Contract FH-11-7568

Descriptors: (*Vehicular traffic control, Computers), (*Interchanges, Vehicular traffic control), Manuals, Motor vehicles, Detectors, Traffic signals, Digital computers, Real time, Cost estimates.
Identifiers: Computerized traffic control systems, Diamond interchanges, Signal control.

The Manual has been developed to assist traffic engineers in the complex operational problem of selecting the most effective pretimed signal control parameter value set (cycle length, splits, phase sequence, offsets) for given diamond interchange geometrics and traffic demands. The procudures for determining the preferred parameter values are delineated in detail and all necessary graphs and tables presented. To illustrate the application of the design manual, a comprehensive example is used, paralleling the steps of the given procedures. All steps are illustrated in detail. (Author)

PB-217 519/8 PC$3.00/MF$0.95
System Development Corp., Santa Monica, Calif.
INSTRUMENTATION CONSIDERATIONS FOR COMPUTERIZED TRAFFIC CONTROL OF A DIAMOND INTERCHANGE COMPLEX.
Technical memo.,
C. T. Barooshian, J. A. Nemeczky, and J. F. Torres. May 72, 93p* SDC-TM-4601/008/01
Contract FH-11-7568

Descriptors: (*Vehicular traffic control, Computers), (*Interchanges, Vehicular traffic control), Motor vehicles, Detectors, Traffic signals, Digital computers, Real time, Cost estimates.
Identifiers: Computerized traffic control systems, Diamond interchanges.

The principal instrumentation considerations for implementing a computerized traffic control system for a diamond interchange complex are described. Such a traffic control system is comprised of a surveillance subsystem (of which the key elements are vehicle detectors), a traffic signal controller subsystem that activates the signal conditions in response to computer commands, a digital computer that receives and processes the data from the detectors and determines the best action to take based on this received data, a communications subsystem that links the computer to both the surveillance subsystem and to the signal controller subsystems, and a traffic control interface unit that serves as a buffer between the communications subsystem and the computer. The characteristics and requirements for each of these subsystems are discussed to the necessary level of detail, with the exception of the computer which has already been determined. A cost estimate for implementing this system at a given site is presented. (Author)

PB-217 521/4 PC$5.00/MF$0.95
Genesee County Planning Board, Batavia, N.Y.
AN INTERPRETIVE REPORT: THE COUNTY HIGHWAY SYSTEM, GENESEE COUNTY, NEW YORK.
Final rept.
Jun 72, 67p GCPB-72-04

Descriptors: (*Regional planning, *New York), (*Highways, Regional planning), Surveys, Maintenance, Project planning, Vehicular traffic control.
Identifiers: *Genesee County (New York).

The report presents to the officials and citizenry of Genesee County a detailed status of the County Highway system evaluated on the basis of safety and comfort afforded the traveler of this network. Goals and objectives of highway transportation in Genesee County are set forth. Recommendations include the use of a county wide development and maintenance program, closer coordination of the various agencies involved in responsibility for the entire highway system, development and implementation of a uniform classification system as well as improved traffic control for all highways in the county. (Author)

PB-217 522/2 PC$5.00/MF$0.95
Genesee County Planning Board, Batavia, N.Y.
GENESEE COUNTY PROGRAM 72. HOUSING: PROBLEMS AND POTENTIALS.
Final rept.
Nov 72, 57p GCPB-72-02
Prepared in cooperation with Kendree and Shepherd Planning Consultants, Inc.

Descriptors: (*Regional planning, *New York), (*Residential buildings, Regional planning), Census, Surveys, Economic factors, Market analysis, Local government, Project planning.
Identifiers: Genesee County (New York).

The report is concerned with an anlysis of the current housing inventory in Genesee County. All available 1960 and 1970 Census data are incorporated in the analysis. The study includes an examination of the economic factors affecting housing, age and condition of housing, types of housing and vacancy ratios. Changes in the housing market between 1960 and 1970 are noted. The attitudes towards the housing market and the problems of active and potential developers in Genesee County are presented. Short range (3 - 7 years) potential residential development sites are given special attention. Proper actions to be taken by the County in order to solve the identified County housing problems are suggested. All eligible State and Federal housing programs are compiled. A model proto-type housing development is presented. (Author)

PB-217 524/8 PC$3.75/MF$0.95
Genesee County Planning Board, Batavia, N.Y.
GENESEE COUNTY, NEW YORK, FINANCIAL ANALYSIS AND CAPITAL IMPROVEMENTS PROGRAM.
Final rept.
Sep 72, 32p GCPB-72-03
Prepared in cooperation with Kendree and Shepherd Planning Consultants, Inc.

Descriptors: (*Regional planning, *New York), Financial management, Taxes, Revenue, Expenses, Liabilities, Budgeting, Projection, Project management.
Identifiers: *Genessee County (New York).

The report contains three major sections. A financial analysis for the County concerning the County's tax structure, revenues, expenditures, special funds, and debt situation are analyzed for the six-year period from 1966 to 1971. Financial projections are made for a six-year period. The second section introduces Capital Improvements Programming as a budgetary tool, and discusses the objectives of such a program. The prerequisites and methodology for Capital Improvements Programming are described. A timetable to be used in the preparation of Capital Improvements Programming is suggested. Finally, the recommendations of the Capital Program Agency for the initial six-year Capital Program are presented. (Author)

PB-217 525/5 PC$4.75/MF$0.95
Monroe County Planning Council, Rochester, N. Y.
POPULATION GROWTH. A FRAMEWORK FOR PLANNING POLICY.
Sep 72, 55p MCPC/NY-72-4

Descriptors: (*Regional planning, *New York), (*Population growth, Regional planning), Distribution (Property), Policies, Urban areas, Rural areas, Statistical data, Development.
Identifiers: *Monroe County (New York).

The report examines the processes and patterns of population growth including its implications for the future. Particular emphasis is given to evaluating the impact of population growth and distribution patterns on Monroe County for the purpose of evaluating alternative development patterns and policies to be considered in the preparation of the county comprehensive plan. Finally, the report stresses the need for Monroe County to plan for the future if it expects to adequately accommodate population growth. (Author)

PB-217 529/7 PC$3.00/MF$0.95
Metropolitan Washington Council of Governments, D. C.
WATER AND SEWER SERVICE NEEDS OF LOW AND MODERATE INCOME HOUSEHOLDS IN METROPOLITAN WASHINGTON.
Housing Information rept. no. 2 (Final).
Dec 72, 54p

Descriptors: (*Urban planning, *District of Columbia), (*Virginia, Urban planning), (*Maryland, Urban planning), Water supplies, Sewers, Residential buildings, Plumbing, Income, Statistical data, Objectives, Budgeting, Cost estimates, Installing.
Identifiers: *Metropolitan Washington Area.

The report summarizes water and sewer problems facing many low and moderate income residents of the Washington Metropolitan Area. The report presents an analysis of the problem, current Federal, State, and local approaches to meeting water and sewer service needs, and a proposed strategy for alleviating the problems. Detailed data on the water and sewer problem in Metropolitan Washington, a schedule of connection and plumbing installation costs, and examples of local assistance programs are contained in the appendices.

PB-217 862/2 PC$4.50/MF$0.95
Cornell Univ., Ithaca, N.Y. Water Resources and Marine Sciences Center.
STUDIES IN THE ANALYSIS OF METROPOLITAN WATER RESOURCE SYSTEMS. VOLUME V: A METHOD OF DATA REDUCTION FOR WATER RESOURCES INFORMATION STORAGE AND RETRIEVAL.
Technical rept.,
K. L. Lewinger. Oct 72, 75p* TR-51 W73-06505, OWRR-C-3101 (3684) (1)
Contract DI-14-31-0001-3684
See also report dated Feb 72, PB-209 209.

Descriptors: (*Water resources, *Information systems), (*Urban areas, Water resources), Data reduction, Information retrieval, Data acquisition, Water quality, Economic models, Computer programs, Benefit cost analysis, Management, Allocation models, Linear programming.
Identifiers: *Management information systems.

Data storage and retrieval expenses represent a significant portion of the cost of operating a management information system. The study focuses on the question of how much data already collected need be stored for future use, and on methods of reducing the quantity of data without necessarily reducing the information content. Several linear interpolation and least squares methods are explored for achieving data reduction, using as a means of illustration twenty-three different types of hydrologic records. Discussed also is the value of the data, the desired accuracy needed for various water resources studies, and the costs of data reduction as compared to data storage and retrieval.

PB-217 864/8 PC$3.00/MF$0.95
Iowa State Water Resources Research Inst., Ames.
DEVELOPMENT OF MODEL FOR PRICING WATER IN PROVIDING A BASIS FOR ALLOCATING WATER AMONG COMPETING USES.
Completion rept.,
John F. Timmons, James R. Prescott, and James J. Jacobs. Nov 72, 9p ISWRRI-47 W73-06507, OWRR-A-036-IA (5)
Contract DI-14-31-0001-3515

Descriptors: (*Water quality, *Benefit cost analysis), Mathematical models, Water resources, Linear programming, Management planning, Water pollution, Soil conservation.
Identifiers: Parametric programming.

The problem of developing relevant water quality levels for a water supply entity is studied. One objective of the study was to develop a systematic and integrated system for establishing the level of quality for a given water supply. To achieve this objective, it was necessary to identify polluters and water uses by quality constituents, quantify the physical linkage of uses, and specify the alternative techniques for diminishing the conflicting quality constituents of the supply. A second objective was to formulate a method to estimate the least-cost means of achieving a particular level of quality and then apply this analytical approach to a water supply area. Another objective was to suggest the major physical, economic, and institutional aspects of a water quality management system. In order to meet these objectives, a model was constructed for estimating costs and benefits of using water for various purposes. (Author Modified Abstract)

PB-218 050/3 PC$3.00/MF$0.95
Central New York Regional Planning and Development Board, Syracuse.
OPEN SPACE PLAN IMPLEMENTATION.
Oct 72, 20p CNYRPDB-RP-72-HUD-246-01-2

Descriptors: (*Regional planning, *New York), Public land, Recreational facilities, Zoning, Land acquisition, Taxes, Management.
Identifiers: *Open space, Central New York region.

The report discusses the techniques of open space implementation including the use of public education, zoning, land acquisition, leasing, easements, tax incentives, agricultural districts, and management practices. The report also includes a list of related federal and state programs and agencies, and status report on open space project implementation in the Central New York Region. The report is one of four companion reports. The other three are: (1) Long Range Open Space Plan and Program; (2) Short Range Open Space Program; and (3) Existing Open Space Inventory. (Author)

PB-218 051/1 PC$4.00/MF$0.95
Central New York Regional Planning and Development Board, Syracuse.
EXISTING OPEN SPACE INVENTORY.
Final rept.
Oct 72, 39p CNYRPDB-RP-72-HUD-246-01-3

Descriptors: (*Regional planning, *New York), Public land, Recreational facilities, Forest land, Farms, Lakes, Ponds, Wildlife, Tables (Data).
Identifiers: *Open space inventory, Central New York region.

The report presents an inventory of existing open space acreage including outdoor recreation facilities, farmlands, forest land, lakes and ponds, wildlife management areas, wetlands, and areas of public fishing access. Thirteen tables summarize and analyze the distribution of open space areas and outdoor recreation facilities by county in the Central New York Region. The report also includes an inventory of all state and county open space areas which are sixty acres or larger. The report is one of a series of four companion reports. The others are (1) Long Range Open Space Plan and Program; (2) Short Range Open Space Development Program, 1973-1980; and (3) Open Space Plan Implementation. (Author)

TT-70-55098/10 PC$3.00
Department of the Interior, Washington, D.C.
WATER ECONOMY. VOLUME 30, NUMBER 10, 1970.
1972, 116p
Trans. of Gospodarka Wodna (Poland) v30 n10 p341-456 1970, by Z. Kaminski. The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Water resources, *Poland), Reviews, Periodicals, Hydraulics, Water supply, Hydroelectric power generation, Irrigation, Reservoirs, Floods, Drainage, Plastics.

Contents: Water economy and hydraulic engineering in Bulgaria; Methods of optimum management of water resources; Relationships between valley water floods and river floods: The Upper Vistula example; Hydroengineering of the Polish academy of sciences; Research on application of plastics in drainage.

TT-70-55098/11 PC$3.00
Department of the Interior, Washington, D.C.
WATER ECONOMY. VOLUME 30, NUMBER 11, 1970.
1972, 111p
Trans. of Gospodarka Wodna (Poland) v30 n11 p381-420 1970, by Piotr Widymski. The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Water resources, Reviews), (*Water pollution, *Poland), Periodicals, Hydraulics, Hydroelectric power generation, Reservoirs, Lysimeters, Water resources, Water quality.

Contents: Hydraulics, hydrology, hydrogeology, meteorology (The range of influence of heated water discharges on downstream river temperatures; Spatial filtration through the bottom of water reservoirs; Influence of expansion reservoirs on the efficiency of hydro-power plants); Water protection against pollution (On the need for scientific research in the field of water pollution protection; River, canal, bank and bottom protection by means of plastics; Contribution to the history of Polish hydro-power engineering; Hydrographical problems of the Baltic Sea in view of the 7th Baltic Oceanographers Conference in Helsinki; Lysimetric research in Poland; Scientific-research work of the institute of water resources administration at the water economics research institute during 1966-1969).

TT-70-55098/12 PC$3.00
Department of the Interior, Washington, D.C.
WATER ECONOMY. VOLUME 30, NUMBER 12, 1970.
1972, 101p
Trans. of Gospodarka Wodna (Poland) v30 n12 p423-456 1970, by Piotr Widymski. The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Water resources, *Poland), Reviews, Periodicals, Floods, Hydraulic models, Hydraulics, Hydrology, Agriculture, Water supply.

Contents: Water economy in Poland; Hydraulics, hydrology, hydrogeology, meteorology; Hydrotechnics; Water economy in agriculture; Seasonal distribution of river outflows; Supply of water to villages.

TT-70-55124/4 PC$3.00
Environmental Protection Agency, Washington, D.C.
AIR CONSERVATION. VOLUME 4, NUMBER 4 (18) 1970.
1972, 79p
Unedited trans. of Ochrona Powietrza (Poland) v4 n4 (18) 1970, by A. Skup. The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Air pollution, *Periodicals), (*Poland, Air pollution), (*Government policies, Air pollution), (*Electrostatic precipitators, Design), (*Carcinogens, *Pyrenes), (*Sulfur dioxide, *Atmospheric diffusion), (*Nitrogen dioxide, Atmospheric composition), Particles, Dust control, Legislation, Public health, Gas filters, Translations, Cathodes, Forests.
Identifiers: *Air pollution effects (Plants), *Air pollution detection.

Contents:
- French-Polish symposium on the protection of the atmosphere;
- Main trends in the atmosphere protection in Poland;
- An approach to systematic measurements of the atmospheric air pollution;
- Legislature and organization of the atmospheric air pollution control in Poland;
- Current problems in the construction of electrofilters;
- Carcinogenic hydrocarbons in the atmospheric air of ten major cities of Poland;
- The range of the influence of the industrial air pollution on forests;
- The effect of atmosphere equilibrium on the spreading of atmosphere pollutants;
- A ferrite electrode for electrostatic precipitators;
- Measurements of the nitrogen dioxide concentration in the atmospheric air in the Bielany suburb of Warsaw.

TT-70-55124/5 PC$3.00
Environmental Protection Agency, Washington, D.C.
AIR CONSERVATION. VOLUME 4, NUMBER 5 (19) 1970.
1972, 74p
Unedited trans. of Ochrona Powietrza (Poland) v4 n5 (19) 33p 1970, by I. Dmowski. The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Air pollution, *Periodicals), (*Poland, Air pollution), (*Fluorides, Air pollution), (*Air pollution control equipment, *Sulfur oxides), (*Scrubbers, *Sulfur oxides), (*Government policies, Air pollution), (*Particles, *Samplers),

Fir trees, Pine trees, Industrial waste treatment, Particles, Public health, Sampling, France, Translations.
Identifiers: *Air pollution effects (Plants), Ammonia scrubbing.

Contents:
- Pollution of the air by fluorine compounds;
- Removal of sulfur from flue gases resulting from the combustion of fuel oils in large thermal-electric power plants;
- Atmospheric pollution and vegetation;
- Effects of atmospheric pollution of coniferous forests;
- French legislation in the sphere of industrial damages and atmospheric pollution;
- Methods of determining the contribution of new scources of emission to the atmospheric pollution level;
- Isokinetic and nonisokinetic sampling of particulates in flue gases;
- Air pollution and the population's health condition news in brief.

UCRL-74063 PC$3.00/MF$0.95
California Univ., Livermore. Lawrence Livermore Lab.
INVESTIGATION OF THE FREQUENCY DISTRIBUTIONS OF SURFACE AIR-POLLUTANT CONCENTRATIONS.
J. B. Knox, and R. I. Pollack. 30 Oct 72, 23p
CONF-721120-1
From Symposium On Statistical Aspects Of Air Quality Data- Chapel Hill, Nc (9 Nov 1972).

Descriptors: *Atmosphere, *Contamination.

For abstract, see NSA 27 06, number 14448.

13C. Construction Equipment Materials, and Supplies

AD-757 137 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
INVESTIGATION OF CEMENT-REPLACEMENT MATERIALS. REPORT 7. COMPARATIVE TESTS OF COMPRESSIVE STRENGTH OF MORTARS CONTAINING POZZOLANS.
Oct 58, 30p Rept no. AEWES-Misc-Paper-6-123-7
Report on CWI Item No. 601, Research in Mass Concrete.

Descriptors: (*Cements, Compressive properties), Test methods, Test equipment, Tables.
Identifiers: *Mortars (Materials), Portland pozzolan cements, Pozzolans, Fly ash, Compressive strength.

The requirement that specimens of a portland cement-pozzolan mortar stored at 100F develop a compressive strength at 28 days age of at least 75 per cent of that of a mortar without pozzolan has been included in Corps of Engineers specifications for fly ash. This requirement has the principal disadvantage of requiring more than a month to obtain the test results. A test using a lime-pozzolan mortar tested at 7 days age after storage at 130F was devised and tried out at two laboratories. The results obtained with it were compared with results from the cement-pozzolan test. This comparison indicated that lime-pozzolan mortars should develop a compressive strength of at least 900 psi in order to be considered as also complying with the 75 per cent limit. Various details of the testing procedure appear to require refinement in order to minimize differences in results between laboratories. (Author)

AD-757 148 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
ANALYSES OF CHECK-TEST RESULTS OF POZZOLAN SAMPLES.
Final rept.,
Leonard Pepper. Feb 73, 51p Rept no. AEWES-TR-C-73-1

Descriptors: (*Construction materials, Tests), Silicon dioxide, Alumina, Iron oxides, Magnesium oxides, Sulfur compounds, Oxides, Moisture, Particle size, Density, Mechanical properties, Thermal properties, Test methods, Analysis of variance.
Identifiers: *Pozzolans, Fly ash, Sulfur trioxide, Autoclaving.

A program of periodic duplicate sampling and check testing of fly ash and other pozzolans was instituted to obtain information that may provide a basis for improving the specifications for and the methods of sampling and testing fly ash and other pozzolans.

AD-757 166 PC$3.00/MF$0.95
Florida Univ Gainesville Dept of Industrial and Systems Engineering
MATRIX FORMULATION AND SOLUTION OF CONVEYOR FLOW PROBLEMS.
Research rept.,
Eginhard J. Muth. Jan 73, 36p Rept no. RR-73-2
AROD-T-1.97-RT
Contract DAHC04-68-C-0002

Descriptors: (*Conveyors, *Material control), Handling, Time studies, Containers, Matrix algebra.
Identifiers: Materials handling, *Material flow.

A closed-loop conveyor system having a single loading station, a single unloading station, and discrete, time-varying input and output flows, is analyzed. The sequence of material flow on the return leg of the conveyor is represented by a difference equation. That equation is reduced to a matrix formulation. Incompatibility is related to the eigenvectors and eigenvalues of the matrix involved, and a general solution procedure is given. The ratio r/p, which is the remainder of the ratio conveyor period to work-cycle period, is shown to be an important criterion for compatibility and optimization. An example is worked out and several solutions are presented graphically. (Author)

AD-757 241 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
INVESTIGATION OF CEMENT-REPLACEMENT MATERIALS. REPORT NO. 9. SIGNIFICANCE OF PULSE-VELOCITY DATA FOR MASS CONCRETE BLOCKS,
E. C. Roshore. Feb 64, 39p Rept no. AEWES-Misc-Paper-6-123-9

Descriptors: (*Cements, Compressive properties), (*Concrete, Army research), Aging (Materials), Elasticity, Moisture, Construction materials, Mixtures, Tests.
Identifiers: Possolans, Ultrasonic tests.

In Phase D (previously reported) of the cement-replacement materials investigation, 25 concrete test blocks, 5 by 100 by 20 ft, were made, each of a different concrete mixtures diffused only in cement factor (ranging from 1-3/4 to 4 bags per cu yd) and type and amount of cement-replacement materials used. The blocks were tested for ultrasonic pulse velocity, at ages ranging from 2 to 360 days, to provide data on performance of cement-replacement materials in mass concrete under field conditions. Variations in the Phase D pulse-velocity data stimulated the investigation reported herein, which has as its objective the development of data on: Pulse velocity of aggregate used in the Phase D blocks; Influence on the pulse velocity of concrete of (1) aggregate pulse transmission path; Relative influence of pulse velocity of fine and of coarse aggregate on pulse velocity of concrete; Means of interpreting observed pulse velocity of concrete in terms of properties of paste phase of the concrete. (Author)

AD-757 242 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
INVESTIGATION OF CEMENT-REPLACEMENT MATERIALS. REPORT II. PULSE VELOCITY AND COMPRESSIVE STRENGTH AT ADVANCED AGES OF PHASE D CONCRETE BLOCKS,
James M. Polatty, Bryant Mather, William O. Tynes, and Edwin C. Roshore. Jun 64, 19p Rept no. AEWES-Misc-Paper-6-123-11
See also AD-757 241.

Descriptors: (*Cements, Compressive properties), (*Concrete, Army research), Aging (Materials), Elasticity, Moisture, Construction materials, Mixtures, Tests.
Identifiers: Pozzolans, Fly ash.

In Phase D of the comprehensive investigation, described in Report 6 of this series, 25 mass concrete test blocks, 5 by 10 by 20 ft, were made from mixtures with nominal cement factors ranging from 1-3/4 to 4 bags per cu yd, with and without cement-replacement materials. The blocks were tested for comprssive strength and pulse velocity at ages from 2 to 360 days. To determine the effects of further aging on the strength and elastic properties of the various mixtures, selected blocks were again tested for compressive strength and all were tested for pulse velocity at ages of 7 to 9 years. For this investigation, nominal 10-in.-diameter cores were drilled from six blocks containing calcined shale, pumicite, or fly ash with cement factors ranging from 1-3/4 to 3 bags per cu yd, and from three comparable blocks containing no pozzolan. The cores were tested for compressive strength and modulus of elasticity. All 25 blocks were tested in place for pulse velocity; block 6 was tested at both 100 and 110 months age. (Author)

AD-757 382 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
COMPARATIVE COMPRESSIVE STRENGTH OF RODDED AND VIBRATED CYLINDERS.
Mar 62, 14p Rept no. AEWES-Misc-Paper-6-476

Descriptors: (*Concrete, Compressive properties), Laboratory equipment, Cylindrical bodies, Construction, Analysis of variance, Test methods, Specifications.
Identifiers: Compressive strength, Compression tests.

The purpose of the study was to obtain compressive strength data on rodded and vibrated concrete cylinders to guide the task group in making recommendations to Subcommittee III-a relative to possible changes in ASTM Designations: C 31-59 and C 192-59. The study constitutes one phase of a comprehensive comparative investigation being conducted cooperatively by various Government and private agencies for this purpose. In the WES portion of the study, five batches each of a high- and a low-slump concrete were mixed from which cylinders were molded and consolidated by rodding or by several methods of vibration. The cylinders were tested for compressive strength at 28 days age. (Author Modified Abstract)

AD-757 400 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
ENGINEERING TESTS OF AGGREGATE DRYER BARBER-GREENE COMPANY MODEL 837, SINGLE DRUM.
Technical memo.
Jun 49, 64p Rept no. AEWES-TM-3-285

Descriptors: (*Driers (Apparatus), Tests), Machines, Mobility, Heating, Cooling, Drying, Diesel engines, Fuel consumption, Construction materials.
Identifiers: Aggregates.

Operational tests and mechanical inspections were conducted as engineering tests of Dryer, Aggregate, Single Drum, Central Plant, Diesel Driven, Trailer Mounted 80-120 TPH, Barber-Greene Model 837 by the Waterways Experiment Station during the period 11 August to 8 September 1948. The objectives of these tests were: (1) to determine the operational and functional characteristics and its interchangeability with the the dual-drum dryer in a standard 11-unit asphalt plant and (2) to investigate any unusual characteristics of the machine. (Author Modified Abstract)

AD-757 405 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
TESTS OF SANDED GROUTS. INFLUENCE OF MANUFACTURED SANDS AND ADMIXTURES ON PUMPABILITY, AND EVALUATION OF A COLCRETE MIXER.
Technical memo.,
Oct 58, 28p Rept no. AEWES-TM-6-419-4
See also Report dated Feb 57, PB-140 190.

Descriptors: (*Grout, Rheology), Additives, Sand, Particle size, Compressive properties, Test methods.
Identifiers: Colcrete, Pumpability.

The report describes two investigations: one was a continuation of studies reported previously to determine the maximum amount of sand that a sanded grout can contain and still be pumpable; the other was an evaluation of a new type of grout mixer, the colcrete, which is a double-drum, rapid mixing device designed especially for grouting work.

AD-757 419 PC$3.00/MF$0.95
Purdue Univ Lafayette Ind School of Civil Engineering
LABORATORY THERMAL EXPANSION MEASURING TECHNIQUES APPLIED TO BITUMINOUS CONCRETE,
Collis C. Hooks, and William H. Goetz. Aug 64,
261p AEWES-CR-4-102
Contract DA-22-079-CIVENG-62-77

Descriptors: (*Asphalt, Thermal expansion), (*Pavements, Concrete), Thermal analysis, Volumetric analysis, Analysis of variance, Temperature, Test methods.
Identifiers: *Bituminous concretes, Aggregates.

A laboratory study was conducted to investigate several methods of measurement applicable to determining the thermal expansion and contraction of bituminous concrete. The primary objective was to select the test methods which would measure most adequately thermal expansion and contraction. Both linear as well as volumetric techniques were investigated over the temperature range of - 30 to 40C. Three volumetric and three linear techniques were investigated in the course of this investigation. (Author Modified Abstract)

AD-757 630 PC$3.00/MF$0.95
Army Construction Engineering Research Lab Champaign Ill
FRACTURE MECHANICS APPLICABILITY TO PORTLAND CEMENT CONCRETES.
Technical manuscript,
D. J. Naus. Mar 73, 26p* Rept no. CERL-TM-M-42
Presented at the Army Science Conference held at U.S. Military Academy, West Point, N. Y., 21 Jun 1972.

Descriptors: (*Concrete, Fracture (Mechanics)), Cements, Ceramic materials, Defects (Materials), Crack propagation, Failure (Mechanics), Deformation, Model tests, Strain (Mechanics), Test methods, Experimental data.
Identifiers: Portland cements.

In the investigation, the applicability of linear-elastic fracture mechanics to portland cement pastes, mortars, and concretes was determined by the fabrication, testing, and analysis of plate specimens containing a precast flaw. A model was developed which provides a qualitative measure of the size of the microcracking zone which occurs in concrete. Experimental results are correlated with the model. (Author Modified Abstract)

AD-757 710 PC$3.00/MF$0.95
Naval Civil Engineering Lab Port Hueneme Calif
POLYTOROIDAL TUNNELING THRUSTER FOR SPECIALIZED NAVY APPLICATIONS.
Technical note,
D. E. Williams, and H. A. Gaberson. Feb 73, 24p
Rept no. NCEL-TN-1266

Descriptors: (*Earth-handling equipment, Feasibility studies), (*Underwater equipment, Earth-handling equipment), Positioning devices (Machinery), Inflatable structures, Configuration, Design, Experimental data.
Identifiers: *Tunneling, *Tunneling machines.

The report introduced an application of vermiculating or worm-like motion, a motion in which a longitudinal wave traverse one of the contacting surfaces in the direction of motion. The high force tunneling thruster was selected as the most promising of several applications. A model polytoroidal thruster using small tire inner tubes as toroidal bladders to operate within a transparent cylinder was fabricated and tested. The use of a transparent cylinder permitted direct observation of the distensions of the inflating and deflating rubber toroids. By positioning the cylinder vertically, thrust loads in the form of dead weights were used for testing. Observation of bladder distortions during operation provided qualitative data. (Author Modified Abstract)

AD-757 715 PC$3.00/MF$0.95
Naval Civil Engineering Lab Port Hueneme Calif
EXPANSIVE CEMENT CONCRETES FOR NAVAL CONSTRUCTION.
Rept. no. 1, Jul 71-Jun 72,
John R. Keeton. Mar 73, 51p* Rept no. NCEL-TN-1264

Descriptors: (*Concrete, Shrinkage), (*Cements, Mixtures), Aging (Materials), Creep, Gravel, Particle size, Flexural strength, Panels (Structural), Modulus of elasticity, Thermal expansion, Freezing, Drying, Compressive properties, Naval research.
Identifiers: *Expanding cements, *Portland cements, Concrete construction, Aggregates.

Expansion and subsequent shrinkage characteristics of shrinkage-compensating concrete were determined in mesh-reinforced prisms as well as in 'standard' Rubin bars. The maximum aggregate size was 3/8 inch. The specimens were cured in fog for 14 days and then subjected to drying in either 25% or 50% relative humidity (both at 73F). Although mixes were made with several different cement contents, most of the specimens were made with 7.5 sacks of cement per cubic yard. For comparison purposes, similar mixes were made with portland cement. (Author Modified Abstract)

BNL-14764 PC$3.00/MF$0.95
Brookhaven National Lab., Upton, N. Y.
PREPARATION, PROPERTIES, AND POTENTIAL APPLICATIONS OF CONCRETE-POLYMER MATERIALS.
M. Steinberg, and J. E. Backstrom. May 70, 33p
CONF-701027-3
From Conference On Radiation And Isotope Techniques In Civil Engineering- Brussels, Belgium (28 Oct 1970).

Descriptors: *Acrylonitrile, *Concretes, *Gamma radiation, *Methacrylic acid/ methyl ester, *Polymers, *Styrene, *Styrene/ p-chloro-.

For abstract, see NSA 27 06, number 12569.

TT-70-57257 PC$3.00/MF$0.95
Bureau of Reclamation, Washington, D. C.
INCREASING THE DURABILITY OF CONCRETE BY ADDITIVES OF SILICON ORGANIC POLYMERS,
V. G. Batrakov. 1972, 169p
Contract NSF-C-466
Trans. of mono. Povyshenie Dolgovechnosti Betona Dobavkami Kremniiorganicheskikh Polimerov, Moscow, 1968 277p. Sponsored in part by National Science Foundation, Washington, D. C. Special Foreign Currency Science Information Program.

Descriptors: (*Concretes, Cement additives), (*Silicone resins, *Cement additives), (*Concrete durability, Silicone resins), Physicochemical properties, Mechanical properties, Frost protection, Reinforced concrete, Concrete construction, Economic analysis, Translations, USSR.

The durability of concrete was studied with additives of silicon organic polymers under the complex action of cyclic freezing and thawing, wetting and drying, capillary suction and evaporation of salt solutions, and also the prolonged continuous action of an aggressive liquid medium. The physico-mechanical properties of concrete with silicon polymer additives were studied. The physico-chemical aspects of the interaction of silicon-organic polymers of the polyhydrosiloxane and sodium siliconate type with the minerals of portland cement, clinker and cements were investigated.

13D. Containers and Packaging

AD-757 353 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
PRECURSORY DEFENSE CONTAINERIZATION PROJECTS DIRECTORY.
Technical rept.,
James P. Hynes. Nov 72, 96p* Rept no. NPS-55HJ72111A

Descriptors: (*Containers, *Directories), (*Logistics, *Packaging), Air transportation, Shipping (Marine), Material control, Handling, Armed forces transportation, Supply depots, Classification.
Identifiers: Containerization, Materials handling.

Containerized cargo movements on land, sea, and air are having significant impacts on the logistical plans and programs of DoD and private industry. This project provides up-to-date information on certain projects and personnel related to DoD containerization interests. The directory is also designed to cross-reference projects, personnel, and activities. It is intended to aid in identifying common areas of interest, pin-point sources of information, and promote the coordination of containerization activities. (Author)

AD-757 631 PC$3.00/MF$0.95
Army Mobility Equipment Research and Development Center Fort Belvoir Va
EVALUATION OF A CABLE-NET ROOF MODEL FOR HASTY FUEL STORAGE RESERVOIRS.
Interim rept. Feb-May 71,
Joe Medrano. Nov 72, 23p Rept no. USAMERDC-2041

Descriptors: (*Roofs, Effectiveness), (*Protective coverings, *Textiles), (*Storage tanks, *Fuels), Protection, Rainfall, Shelters, Cables (Mechanical), Anchors (Structural), Performance (Engineering).
Identifiers: Evaluation, Fuel storage reservoirs.

The report covers the testing and evaluation of a cable-net roof model to determine its suitability of eliminating rain water from the top surface of hasty fuel storage reservoirs. The roof model was

field tested under simulated and actual rainfall conditions. The test showed that the weight of water from heavy rainfalls that could collect on the roof surface caused the deadman anchors to creep, and as a result the cable structure sagged. The rainwater has a tendency to accumulate in the span between cables before cascading occurred, since the direction of water runoff was perpendicular to the position of the main suspension cables. (Author)

13E. Couplings, Fittings, Fasteners, and Joints

N73-16519 PC$7.25/MF$0.95
Westinghouse Astronuclear Lab., Pittsburgh, Pa.
EVALUATION OF TANTALUM 316 STAINLESS STEEL TRANSITION JOINTS.
D. R. Stoner. Dec 72, 101p NASA-CR-121111, WANL-M-FR-72-006
Contract NAS3-13444

Descriptors: *Metal joints, *Stainless steels, *Tantalum, Bonding, Extruding, Snap 8, Thermal cycling tests.

For abstract, see STAR 11 07.

13F. Ground Transportation Equipment

AD-757 713 PC$3.00/MF$0.95
Grumman Aerospace Corp Bethpage N Y Research Dept
TRACTIVE PERFORMANCE OF WHEELS IN SOFT SOILS.
Research rept.,
Leslie L. Karafiath, and Edward A. Nowatzki.
Feb 73, 41p Rept no. RE-443J
Contract DAAE07-72-C-0033
Presented in the 1972 Winter Meeting of the American Society of Agricultural Engineers in Chicago, Ill., Dec 72.

Descriptors: (*Vehicle wheels, *Soil mechanics), Failure (Mechanics), Interactions, Plasticity, Friction, Torque, Structural properties, Compressive properties, Differential equations, Deflection, Mathematical models, Loading (Mechanics), Trafficability, Programming (Computers), Integration.
Identifiers: Traction, *Soil wheel interactions, Computation.

The traction developed by a wheel can be determined by appropriate integration of the soil wheel interface stresses. In soft soils these are governed by failure conditions in the soil brought about by the wheel load. The geometry of the two failure zones (front and rear), as well as the associated stresses, are computed by solving the differential equations of plasticity by numerical techniques. A flow diagram shows the computation of failure zones and associated interface stresses that yield the load, torque and traction for a given wheel geometry and interface friction. Slip-shear stress equations are used to relate interface friction to slip. The solution of the practical problem of determining traction and slip for given soil conditions and applied wheel load and torque requires an iteration procedure that is shown in another flow diagram. Inputs for the computer program are soil properties, wheel load, and torque; the end outputs are traction slip and sinkage. For the computation of traction exerted by tires, a soil-tire model has been developed that allows for the deflection of the tire and attendant restraint of the normal interface stresses. (Author)

N73-16217 PC$4.50/MF$0.95
Stanford Univ., Calif. Dept. of Aeronautics and Astronautics.
THE LUNAR HOPPING TRANSPORTER.
Final Report
R. Degner, M. Kaplan, J. Manning, R. Meetin, and S. Pasternack. Jul 71, 48p NASA-CR-130010, SUDAAR-428
Contract NGR-05-020-258

Descriptors: *Hoppers, *Lunar surface vehicles, *Structural design, Human factors engineering, Lunar exploration, Operational problems, Walking machines.

For abstract, see STAR 11 07.

N73-16219 PC$5.25/MF$0.95
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
RECOMMENDATIONS RELATIVE TO THE SCIENTIFIC MISSIONS OF A MARS AUTOMATED ROVING VEHICLE (MARV).
R. L. Spencer. Jan 73, 64p NASA-TM-X-64719

Descriptors: *Experimental design, *Mars surface, *Roving vehicles, *Space exploration, Automatic test equipment, Instrument packages, Mission planning.

For abstract, see STAR 11 07.

N73-16817 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
MOBILITY PERFORMANCE OF THE LUNAR ROVING VEHICLE TERRESTRIAL STUDIES APOLLO 15 RESULTS.
N. C. Costes, J. E. Farmer, and E. B. George. Dec 72, 87p NASA-TR-R-401, M451
Conf- Presented At 4th Intern. Conf. of the Intern. Soc. for Terrain-vehicle Systems, Stockholm and Kiruna, Sweden, 24-28 Apr. 1972

Descriptors: *Lunar roving vehicles, *Manned lunar surface vehicles, *Performance, Apollo 15 flight, Lunar exploration, Performance prediction, Postflight analysis.

For abstract, see STAR 11 07.

PB-216 411/9 PC$3.75/MF$0.95
Bendix Research Labs., Southfield, Mich.
A STUDY OF THE AERODYNAMIC EFFECTS AND STABILITY CHARACTERISTICS OF BUSES. VOLUME I: SUMMARY REPORT.
Final rept., 8 Feb-8 Dec-72,
Richard E. Wong, Markell Seitzman, Shang-Li Chiang, and Calvin C. Matle. Nov 72, 37p* Rept. no. BRL-6451-Vol-1 DOT-HS-800 797
Contract DOT-HS-090-2-291
See also Volume 2, PB-216 412.

Descriptors: (*Buses (Vehicles), Passing encounters), (*Aerodynamic forces, *Motor vehicles), Computerized simulation, Control, Aerodynamic stability, Braking, Wind, Automobiles, Trucks, Highways, Traffic safety.
Identifiers: *Vehicle passing.

A digital computer simulation was used to predict and compare the stability characteristics of the standard and wide intercity buses. A hybrid computer simulation was used to predict the effects on vehicle stability, control and path deviation caused by aerodynamic disturbances generated when the standard or wide buses and trucks pass small or intermediate size passenger cars and cars towing a recreational trailer. Simulation results indicate that in general the wide bus provides better stability performance than that of the standard bus. Study results also indicate that cross-winds have a more pronounced effect on vehicle path deviation than perturbation due to bus width. There are no appreciable differences in vehicle path deviations during encounters between the passenger vehicles studied and the standard or wide buses or trucks in the absence of cross-wind. In the case where the buses or trucks pass the small or intermediate cars in the presence of cross-winds the tendency is to draw the vehicles toward the side of the passing vehicle, whereas in the case of an intermediate car towing a travel trailer the passing vehicles cause the combination vehicle to move away from the passing vehicles toward the right edge of the lane. A qualitative assessment of the simulation results was made and is presented and discussed. (Author Modified Abstract)

PB-216 412/7 PC$9.00/MF$0.95
Bendix Research Labs., Southfield, Mich.
A STUDY OF THE AERODYNAMIC EFFECTS AND STABILITY CHARACTERISTICS OF BUSES. VOLUME II: TECHNICAL REPORT.
Final rept., 8 Feb-8 Dec 72,
Richard E. Wong, Markel Seitzman, Shang-Li Chiang, and Calvin C. Matle. Nov 72, 355p BRL-6451-Vol-2 DOT-HS-800 798
Contract DOT-HS-090-2-291
See also Volume 1, PB-216 411.

Descriptors: (*Buses (Vehicles), Passing encounters), (*Aerodynamic forces, *Motor vehicles), Computerized simulation, Hybrid computers, Control, Braking, Wind, Automobiles, Trucks, Highways, Traffic safety.
Identifiers: Vehicle passing.

This volume discusses stability characteristics and passing effects on passenger cars and cars towing a recreational trailer.

PB-216 972/0 PC$9.75/MF$0.95
Mueser, Rutledge, Wentworth and Johnston, New York.
SUBSURFACE INVESTIGATION, L'ENFANT--PENTAGON ROUTE, STATIONS 57 PLUS 00 (L001) TO 175 PLUS 00 (L002).
Final rept.
Dec 70, 152p MRWJ-70-46
Sponsored in part by Washington Metropolitan Area Transit Authority, D. C.

Descriptors: (*Subway railways, *District of Columbia), (*Railroad stations, *Subsurface investigations), Foundations, Rock mechanics, Soil mechanics, Tunneling (Excavation), Subsurface structures, Boring Subsoil, Urban transportation, Mass transportation, Urban planning, Routes.
Identifiers: Foundation engineering, L'Enfant-Pentagon Route, Design section L001, Design section L002.

Results of 37 borings performed for the crossing of Washington Channel and Potomac River in L'Enfant-Pentagon Route of the Washington Metropolitan Area Metro System are summarized in this report. The section explored extends from the intersection of Frontage Road and 7th Street S. W. to a point directly east of the Pentagon Building in Arlington, Virginia. The report contains a continuous geological section along the subway line, logs of the borings, engineering laboratory test results and conclusions regarding subsoil properties. (Author)

PB-216 973/8 PC$3.00/MF$0.95
Mueser, Rutledge, Wentworth and Johnston, New York.
SUBSURFACE INVESTIGATION, GREENBELT ROUTE, STATIONS 3 PLUS 00S (E001) TO 259 PLUS 30 (E004).
Final rept.
Oct 71, 246p MRWJ-71-57
Sponsored in part by Washington Metropolitan Area Transit Authority, D. C.

Descriptors: (*Subway railways, *District of Columbia), (*Railroad stations, *Subsurface investigations), Foundations, Rock mechanics, Soil mechanics, Tunneling (Excavation), Subsurface structures, Boring, Subsoil, Urban transportation, Mass transportation, Urban planning, Routes.
Identifiers: Foundation engineering, Greenbelt Route, Design section E001, Design section E004.

Results of 95 borings made along Greenbelt Route between the intersection of F and 7th Streets N. W. and the planned Fort Totten Station at the intersection with the B and O Metropolitan Branch of the Washington Metropolitan Area Metro System are summarized. The report contains a continuous geological section along the line of the proposed subway, logs of the borings, results of laboratory tests on split-spoon and undisturbed samples and conclusions regarding subsoil properties.

PB-216 974/6 PC$6.00/MF$0.95
Mueser, Rutledge, Wentworth and Johnston, New York.
SUBSURFACE INVESTIGATION, BRANCH ROUTE, STATIONS 108 PLUS 60 (F003) TO 454 PLUS 00 (F008).
Final rept.
Feb 73, 310p MRWJ-73-78
Sponsored in part by Washington Metropolitan Area Transit Authority, D. C.

Descriptors: (*Subway railways, *District of Columbia), (*Railroad stations, *Subsurface investigations), Foundations, Rock mechanics, Soil mechanics, Tunneling (Excavation), Subsurface structures, Boring, Subsoil, Urban transportation, Mass transportation, Urban planning, Routes.
Identifiers: Foundation engineering, Branch route, Design section F003, Design section F008.

Results of 92 borings made on Branch Route between First and M Street in S. W. Washington and Henson Creek in Prince Georges County, Maryland, of the Washington Metropolitan Area Metro System are summarized. The report contains a continuous geological section along the subway through these sections of Branch Route, logs of the borings, results of laboratory testing of soils and conclusions regarding subsoil properties. The final section of the report summarizes the subsoil conditions expected to be encountered in the various sections of Branch Route with recommendations concerning anticipated design and construction problems. (Author)

PB-217 109/8 MF$0.95-NTIS
Mueser, Rutledge, Wentworth and Johnston, New York.
SUBSURFACE INVESTIGATION: CONNECTICUT AVENUE ROUTE AT ROCK CREEK PARK, TEST BORING.
Supplementary rept. no. 1.
19 Jul 68, 19p MRWJ-68-17
Sponsored in part by Washington Metropolitan Area Transit Authority, D.C.

Descriptors: (*Subway railways, *District of Columbia), (*Routes, *Subsurface investigations), Foundations, Rock mechanics, Soil mechanics, Tunneling (Excavation), Subsurface structures, Boring, Subsoil, Urban transportation, Mass transportation, Urban planning.
Identifiers: Foundation engineering, Connecticut Avenue Route, Rock Creek Park.

Results of one test boring performed near the south portal of the Connecticut Avenue Route at Rock Creek Park of the Washington Metropolitan Area Metro System are summarized in the supplementary report. It contains a revised geological section through the boring, a log of the boring and photographs of rock cores recovered. (Author)

PB-217 224/5 PC$3.00/MF$0.95
Mueser, Rutledge, Wentworth and Johnston, New York.
DESIGN SECTION K001B, VIENNA ROUTE. SUBSURFACE INVESTIGATION, COURT HOUSE STATION.
Rept. no. 1.
5 Jan 73, 20p MRWJ-73-80
Sponsored in part by Washington Metropolitan Area Transit Authority, D.C.

Descriptors: (*Subway railways, *District of Columbia), (*Railroad stations, *Subsurface investigations), Foundations, Rock mechanics, Soil mechanics, Tunneling (Excavation), Subsurface structures, Boring, Subsoil, Urban transportation, Mass transportation, Urban planning.
Identifiers: Foundation engineering, Vienna Route, Court House Station, Design section K001b.

Results of six borings made in Arlington, Virginia at the location of the proposed Court House Station of Vienna Route of the Washington Metropolitan Area Metro System are summarized in the report. It contains a geological section through the borings, logs of the borings, laboratory test results and conclusions regarding subsurface conditions. (Author)

13G. Hydraulic and Pneumatic Equipment

AD-757 722 PC$3.00/MF$0.95
Oklahoma State Univ Stillwater Fluid Power Research Center
HYDRAULIC CYLINDER AND SEAL SPECIFICATION STUDY. ANNUAL REPORT, SECTION I.
Rept. for 1 Oct 70-1 Sep 72.
Sep 72, 129p* Rept no. OSU-FPRC-2M1
Contracts DAAK02-71-C-0074, DAAK02-72-C-0172

Descriptors: (*Hydraulic cylinders, Specifications), (*Hydraulic seals, Specifications), Seals, Acceptability, Contamination.

The purpose of the hydraulic specification program was to develop industrially acceptable test procedures and requirement specifications relative to the performance of hydraulic components and systems to facilitate the military's 'buy commercial' approach. Although the program has been aimed toward components and systems for future 3000 psi operating pressure levels, it was intended that the test procedures be applicable to any pressure level. The report presents a detailed account of the experimental verification part of the hydraulic cylinder and seal studies. It relates the problems encountered as well as the solutions, as reflected in the revised test procedures and specifications. The three components considered in this report are hydraulic cylinders, hydraulic pressure seals, and wiper seals (exclusion devices). (Author)

PB-216 397/0 PC$3.00/MF$0.95
Carnegie-Mellon Univ., Pittsburgh, Pa.
A NUMERICAL MODEL FOR THE STUDY OF PARTICLE INTERACTIONS IN RELATION TO HYDRAULIC TRANSPORT.
Final rept., 1 Jan 71-30 Jun 72,
Andrew K. C. Wong, and T. S. Liu. 30 Jun 72, 168p BuMines-OFR-5-73
Grant DI-G0111025

Descriptors: (*Mine haulage, Pipelines), (*Pipelines, Laminar flow), Granular materials, Specific gravity, Drag, Differential equations, Mathematical models, Computer systems software, Particle interactions.
Identifiers: *Hydraulic transport, Durand's equation.

The research is an attempt to develop a numerical method for studying some of the basic relations that govern particle interaction in laminar flow field so as to (1) acquire better understanding of the flow phenomena, and (2) extend the knowledge of the derived analytical results for the modification of the existing formulas. The study model consists of two parts. The first part is to investigate the effect of particle spacings (or concentration) and specific gravity on the particle drag coefficients when particles settle in groups in a given fluid. The study is to establish a relation between draft coefficient and concentration in Durand's formula, which at present implies that the former is independent of the latter. The second part attempts to analyze, by solving the non-linear differential equation, the translation, rolling, lifting of circular particles flowing in long horizontal channel in the laminar regime, so as to correlate the geometric parameters with the hydraulic parameters.

13H. Industrial Processes

AD-757 561 PC$3.00/MF$0.95
Aeroprojects Inc West Chester Pa
ULTRASONIC BEAM LEAD BONDING EQUIPMENT.
Final technical rept. 10 May 71-30 Sep 72,
Janet Devine. Feb 73, 29p* Rept no. RR-72-35
RADC-TR-73-27
Contract F30602-71-C-0150

Descriptors: (*Ultrasonic welding, *Integrated circuits), (*Circuit interconnections, Ultrasonic welding), Reliability (Electronics), Aluminum, Microminiaturization (Electronics).
Identifiers: Welding machines.

Initial effort established the feasibility and practicability of an ultrasonic torsional welding system for simultaneously bonding the beam leads of a hybrid integrated circuit device to a suitable substrate. The design, fabrication, and evaluation of a laboratory welder for this application delineated requirements for an experimental ultrasonic beam lead bonder for field evaluation. The experimental unit consisted of a 60-kHz ultrasonic torsional welding system installed in a modified commercial micropositioner which provided x-y positioning of the beam leaded chip and incorporated an optical system with indexing for visual alignment of the chip. The welder accepts electrical power input up to about 50 watts and weld time up to 1.2 seconds; experimental data indicate this capability to be adequate for bonding commercially available beam lead devices. The process represents a practical alternative to current beam lead bonding techniques. (Author)

JPRS-58148 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
SELECTED TRANSLATIONS IN METALLURGY,
N. G. Pospelov, V. A. Royanov, D. M. Bobrishchev-Pushkin, I. V. Suzdalev, and G. D. Nikiforov. 5 Feb 73, 29p
Trans. of Svarochnoe Proizvodstvo (USSR) n11 p22-23, 34-35, 43-48 1972.

Descriptors: (*Welded joints, High strength steels), (*Flame spraying, Torches), (*Electron beam welding, Industrial medicine), (*Argonarc welding, Titanium alloys), (*Pulsation welding, Aluminum alloys), Heat treatment, Ceramics, Beryllium bronzes, Cavities, Leakage, USSR, Translations.

Contents:
- Effect of order of welding and heat treatment operations on mechanical properties of thin-sheet weld joints of N18K9M5T steel;
- Use of 'Plamya-62' cutting torches for plating ceramics;
- Health evaluation of electron beam welding of beryllium bronze;
- Effect of angle of inclination of electrode on formation of gas cavities in weld root during argon-arc welding of titanium;
- Evaluation of integrity of welds of AMg6 alloy by pulse welding.

JPRS-58217 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.

ECONOMIC EFFECTIVENESS OF POWDER METALLURGY OF TITANIUM,
A. I. Kanyuk, Yu. G. Olesov, and V. S. Ustinov.
13 Feb 73, 10p
Trans. of Tsvetnye Metally (USSR) n5 p68-71 1972.

Descriptors: (*Powder metallurgy, *Titanium), Cost effectiveness, USSR, Cermets, Porous materials, Compacts, Metal powder, Protective coatings, Translations.

The report contains a discussion of how with powder metallurgy raw materials can be used efficiently, mechanical processing can be minimized and various compositions with given porosity, strength, heat and corrosion resistance can be produced. (Author)

JPRS-58291 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
SELECTED TRANSLATIONS ON WELDING,
V. I. Etingov, V. P. Kruchinin, I. Ya. Zubarev, and G. V. Konyushkov. 22 Feb 73, 24p
Trans. of Svorochnoe Proizvodstvo (USSR) n12 p38-42, 50, 55-56 1972.

Descriptors: (*Welded joints, *Stress relieving), (*Brazing, Cermets), (*Pressure welding, Titanium alloys), (*Welding machines, Diffusion welding), Hydrostatic pressure, Residual stresses, Pressure vessels, Vacuum apparatus, USSR, Translations.

Contents:
Lowering the residual stresses in weld joints of forge-welded vessels by hydrocompression;
Contact-reactive ceramic-metal brazing;
Butt welding of titanium alloy VT5-1 rings;
Vacuum-diffusion welding unit.

MLM-1984 PC$3.00/MF$0.95
Mound Lab., Miamisburg, Ohio.
MANUFACTURING PHILOSOPHY.
D. E. Wendeln. 29 Dec 72, 9p
Contract AT-33-1-GEN-53

Descriptors: *Engineering.

For abstract, see NSA 27 06, number 14409.

N73-16520 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
AN IMPROVED DIFFUSION WELDING TECHNIQUE FOR TD-NICR.
K. H. Holko. Feb 73, 24p NASA-TN-D-7153, E-7190

Descriptors: *Diffusion welding, *Nickel steels, *Weld strength, *Welded joints, Creep rupture strength, Physical properties, Temperature effects.

For abstract, see STAR 11 07.

N73-16523 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
INFLUENCE OF VARIOUS SURFACE PRETREATMENTS ON ADHERENCE OF SPUTTERED MOLYBDENUM DISULFIDE TO SILVER, GOLD, COPPER, AND BRONZE.
T. Spalvins. Feb 73, 19p NASA-TN-D-7169, E-7062

Descriptors: *Bronzes, *Copper, *Gold, *Molybdenum disulfides, *Silver, *Sputtering, *Surface finishing, Electron microscopes, Friction, Lubricants, Thin films, Wear.

For abstract, see STAR 11 07.

PB-217 497/7 PC$3.75/MF$0.95
Transport and Road Research Lab., Crowthorne (England).
THE WIBAU DUSTLESS ASPHALT PLANT: THE PERFORMANCE OF EUROPEAN INSTALLATIONS,
B. W. Ferne, and G. D. Goodsall. 1973, 46p*
TRRL-LR-533

Descriptors: (*Industrial plants, *Bitiminous concretes), (*Dust control, Industrial plants), Plant layout, Binders (Materials), Adhesives, Standards, Mixtures, Additives, Aggregates, Bitumens, Air pollution, Denmark, France, Switzerland, Great Britain.

In the Wibau dustless (SL) asphalt plant, the binder is added to the aggregate before it is dried and heated in contrast to a conventional plant in which the sequence of events is reversed. This new process virtually eliminates the discharge of dust into the atmosphere without the need to provide expensive dust collecting equipment and has other possible economic advantages deriving from its ability to carry out production in two stages. A group representing the Department of the Environment's Transport and Road Research Laboratory and Engineering Intelligence Division, and the Asphalt and Coated Macadam Association have visited five plants in Western Europe in order to assess their ability to produce satisfactory bituminous materials. The report gives details of the information gathered during the visits and expresses opinions, agreed by the party, on the observations made.

UCRL-74243 PC$3.00/MF$0.95
California Univ., Livermore. Lawrence Livermore Lab.
DETERMINISTIC APPROACH TO MACHINING ACCURACY.
R. R. Donaldson. 4 Oct 72, 10p CONF-721103-3
From Fabrication Technology Symposium- Golden, Co (10 Nov 1972).

Descriptors: *Machining.

For abstract, see NSA 27 06, number 14449.

Y-DA-4836 PC$3.00/MF$0.95
Oak Ridge Y-12 Plant, Tenn. (Usa).
HIGH-SPEED MOTION PICTURES FOR METAL-CUTTING ANALYSIS.
R. L. Williams. Dec 72, 13p CONF-721130-32
Contract W-7405-ENG-26
From Precision Machining And Gaging Conference- Oak Ridge, Tn (14 Nov 1972).

Descriptors: *Metals.

For abstract, see NSA 27 06, number 14454.

Y-DA-4941 PC$3.00/MF$0.95
Oak Ridge Y-12 Plant, Tenn. (Usa).
MACHINE TOOL CONTROL VIA A MINICOMPUTER.
G. L. Bowers. Dec 72, 7p CONF-721130-5
Contract W-7405-ENG-26
From Precision Machining And Gaging Conference, Oak Ridge, Tn (14 Nov 1972).

Descriptors: *Machine tools.

For abstract, see NSA 27 06, number 14459.

Y-DN-14 PC$3.00/MF$0.95
Oak Ridge Y-12 Plant, Tenn. (Usa).
INSPECTION MACHINE UPGRADING.
J. W. Smith. Dec 72, 16p CONF-721130-26
Contract W-7405-ENG-26
From Precision Machining And Gaging Conference, Oak Ridge, Tn (14 Nov 1972).

Descriptors: *Inspection.

For abstract, see NSA 27 06, number 14462.

Y-EC-142 PC$3.00/MF$0.95
Oak Ridge Y-12 Plant, Tenn. (Usa).
ENVIRONMENTAL CONTROL FOR PRECISION MACHINING.
E. E. Choat. Dec 72, 14p CONF-721130-10
Contract W-7405-ENG-26
From Precision Machining And Gaging Conference, Oak Ridge, Tn (14 Nov 1972).

Descriptors: *Machining.

For abstract, see NSA 27 06, number 14465.

Y-EC-143 PC$3.00/MF$0.95
Oak Ridge Y-12 Plant, Tenn. (Usa).
CLEANLINESS CONTROL.
J. W. Bagwell. Dec 72, 8p CONF-721130-3
Contract W-7405-ENG-26
From Precision Machining And Gaging Conference, Oak Ridge, Tn (14 Nov 1972).

Descriptors: *Machining.

For abstract, see NSA 27 06, number 14466.

13I. Machinery and Tools

AD-757 452 PC$3.00/MF$0.95
Naval Engineering Experiment Station Annapolis Md
NOISE AND WEAR CHARACTERISTICS OF WATER LUBRICATED BEARINGS AND MATERIAL FOR STRUT AND STERN TUBE SERVICE,
S. U. Patton. 26 Apr 51, 99p Rept no.
NAVENGRXSTA-9F966708
Revision of report dated 14 Feb 51.

Descriptors: (*Journal bearings, Performance (Engineering)), (*Submarines, *Submarine noise), Rubber, Synthetic rubber, Wear resistance, Vibration, Lubrication, Water, Test methods.
Identifiers: *Bearing noise.

A Naval station was authorized to conduct an investigation into noise producing characteristics of various elastomers used for stern tube and strut bearings on Naval vessels. The report presents, as a portion of this investigation, the results of an intensive study of natural rubber staves and Buna 'N' staves of four different hardnesses. In addition, some preliminary information on GRS synthetic rubber, laminated phenolics, and lignum vitae is reported. Tests were conducted on a 14 in. diameter by 18 in. long bearing assembly, on a special 10 in. diameter single stave machine, and on a 6 in. diameter by 12 in. long half bearing assembly. (Author Modified Abstract)

AD-757 604 PC$3.00/MF$0.95
Foster-Miller Associates Inc Waltham Mass
DYNAMIC RADIAL EXPANSION OF HELICAL SPRINGS DUE TO LONGITUDINAL IMPACT.
Technical rept.,
Vijay K. Stokes. Oct 72, 81p SWERR-TR-72-75
Contract DAAF03-72-C-0009

Descriptors: (*Helical springs, Performance (Engineering)), (*Recoil mechanisms, Helical springs), (*Tanks (Combat vehicles), *Guns), Equations of motion, Compressive properties, Strain (Mechanics), Stresses, Impact, Mathematical models.
Identifiers: Radial expansion, Dynamic expansion.

Analyses and experiments were conducted on the dynamic radial expansion of helical springs under impact loading. The basic equations of motion were normalized to retain terms of the same order. A mathematical model by which the radial expansion is described as the result of a two-wave interaction was developed by use of suitable approximations to the modified equations of motion. An expression was derived that showed the dynamic radial expansion to be a function of the mean coil diameter, helix angle, and the ratio of impact velocity to the axial surge wave velocity. Impact

tests were made on specially designed springs, and the resulting motions were recorded with a high-speed camera. (Author Modified Abstract)

AEEW-M-1123 PC$3.00/MF$0.95
Atomic Energy Establishment, Winfrith (England).
NEW MODEL FOR THE DYNAMICS OF STEAM DRUMS.
A. Hopkinson. Mar 72, 9p
U. S. Sales only

Descriptors: *Separators.

For abstract, see NSA 27 06, number 14337.

N73-16515 PC$12.50/MF$0.95
Bertea Corp., Irvine, Calif.
DESIGN AND EVALUATION OF AN ELECTROHYDRAULIC SERVOACTUATOR USING ACTIVE STANDBY REDUNDANCY.
Final Progress Report
R. L. Anderson, and W. E. Cover. 12 Sep 72, 209p
NASA-CR-124027, BERTEA-221400-17
Contract NAS8-27821

Descriptors: *Redundancy, *Servomotors, Actuators, Electric control, Hydraulic control, Reliability engineering, Switching.

For abstract, see STAR 11 07.

Y-DA-4837 PC$3.00/MF$0.95
Oak Ridge Y-12 Plant, Tenn. (Usa).
UPGRADING NUMERICALLY CONTROLLED MACHINE TOOLS FOR ERROR REDUCTION.
S. S. Douglass. Dec 72, 12p CONF-721130-13
Contract W-7405-ENG-26
From Precision Machining And Gaging Conference, Oak Ridge, Tn (14 Nov 1972).

Descriptors: *Machine tools.

For abstract, see NSA 27 06, number 14455.

Y-DA-4838 PC$3.00/MF$0.95
Oak Ridge Y-12 Plant, Tenn. (Usa).
AIR-BEARING REWORK AND IMPREGNATION.
W. H. Rasnick. Dec 72, 12p CONF-721130-22
Contract W-7405-ENG-26
From Precision Machining And Gaging Conference, Oak Ridge, Tn (14 Nov 1972).

Descriptors: *Bearings.

For abstract, see NSA 27 06, number 14456.

Y-DA-4841 PC$3.00/MF$0.95
Oak Ridge Y-12 Plant, Tenn. (Usa).
PART SUPPORT.
W. F. Jones. Dec 72, 10p CONF-721130-31
Contract W-7405-ENG-26
From Precision Machining And Gaging Conference- Oak Ridge, Tn (14 Nov 1972).

Descriptors: *Hemispheres.

For abstract, see NSA 27 06, number 14458.

Y-EC-141 PC$3.00/MF$0.95
Oak Ridge Y-12 Plant, Tenn. (Usa).
SITE PREPARATION AND MACHINE INSTALLATION.
B. H. Hale. Dec 72, 6p CONF-721130-17
Contract W-7405-ENG-26
From Precision Machining And Gaging Conference, Oak Ridge, Tn (14 Nov 1972).

Descriptors: *Machine tools.

For abstract, see NSA 27 06, number 14464.

Y-EC-155 PC$3.00/MF$0.95
Oak Ridge Y-12 Plant, Tenn. (Usa).
PART PROGRAMMING FOR NUMERICAL CONTROL MACHINING AND GAGING.
P. J. Anderson. Dec 72, 11p CONF-721130-1
Contract W-7405-ENG-26
From Precision Machining And Gaging Conference, Oak Ridge, Tn (14 Nov 1972).

Descriptors: *Machine tools.

For abstract, see NSA 27 06, number 14468.

Y-NA-221 PC$3.00/MF$0.95
Oak Ridge Y-12 Plant, Tenn. (Usa).
OVERALL MACHINE EVALUATION.
H. A. Tunnell. Dec 72, 8p CONF-721130-29
Contract W-7405-ENG-26
From Precision Machining And Gaging Conference, Oak Ridge, Tn (14 Nov 1972).

Descriptors: *Machine tools.

For abstract, see NSA 27 06, number 14469.

Y-NA-222 PC$3.00/MF$0.95
Oak Ridge Y-12 Plant, Tenn. (Usa).
STRAIGHTNESS AND ALIGNMENT CHECKS ON MACHINE TOOLS.
J. L. Huff. Dec 72, 8p CONF-721130-18
Contract W-7405-ENG-26
From Precision Machining And Gaging Conference, Oak Ridge, Tn (14 Nov 1972).

Descriptors: *Machine tools.

For abstract, see NSA 27 06, number 14470.

Y-NA-223 PC$3.00/MF$0.95
Oak Ridge Y-12 Plant, Tenn. (Usa).
AUTOMATIC TOOL SETTERS.
W. D. Cain. Dec 72, 6p CONF-721130-9
Contract W-7405-ENG-26
From Precision Machining And Gaging Conference, Oak Ridge, Tn (14 Nov 1972).

Descriptors: *Machine tools.

For abstract, see NSA 27 06, number 14471.

Y-NA-224 PC$3.00/MF$0.95
Oak Ridge Y-12 Plant, Tenn. (Usa).
MECHANICAL MAINTENANCE OF PRECISION MACHINE TOOLS.
S. M. Murphy. Dec 72, 13p CONF-721130-20
Contract W-7405-ENG-26
From Precision Machining And Gaging Conference, Oak Ridge, Tn (14 Nov 1972).

Descriptors: *Machine tools.

For abstract, see NSA 27 06, number 14472.

Y-NA-225 PC$3.00/MF$0.95
Oak Ridge Y-12 Plant, Tenn. (Usa).
ANALYSIS OF A MAJOR TOOL REBUILDING PROGRAM.
J. Conn. Dec 72, 7p CONF-721130-11
Contract W-7405-ENG-26
From Precision Machining And Gaging Conference- Oak Ridge, Tn (14 Nov 1972).

Descriptors: *Machine tools.

For abstract, see NSA 27 06, number 14473.

Y-NA-227 PC$3.00/MF$0.95
Oak Ridge Y-12 Plant, Tenn. (Usa).
PRECISION CUTTING TOOLS.
W. E. Stephens. Dec 72, 9p CONF-721130-25
Contract W-7405-ENG-26
From Precision Machining And Gaging Conference, Oak Ridge, Tn (14 Nov 1972).

Descriptors: *Cutting tools.

For abstract, see NSA 27 06, number 14474.

Y-NA-228 PC$3.00/MF$0.95
Oak Ridge Y-12 Plant, Tenn. (Usa).
SPINDLE THERMAL EFFECTS.
T. A. Arehart Jr. Dec 72, 9p CONF-721130-2
Contract W-7405-ENG-26
From Precision Machining And Gaging Conference, Oak Ridge, Tn (14 Nov 1972).

Descriptors: *Machine tools.

For abstract, see NSA 27 06, number 14475.

Y-NA-230 PC$3.00/MF$0.95
Oak Ridge Y-12 Plant, Tenn. (Usa).
INTERFEROMETRIC TECHNIQUES IN DYNAMIC ERROR MONITORING.
C. M. Lay, and J. H. Burkhardt Jr. Dec 72, 6p CONF-721130-34
Contract W-7405-ENG-26
From Precision Machining And Gaging Conference, Oak Ridge, Tn (14 Nov 1972).

Descriptors: *Machine tools.

For abstract, see NSA 27 06, number 14476.

Y-NA-231 PC$3.00/MF$0.95
Oak Ridge Y-12 Plant, Tenn. (Usa).
STATISTICAL TECHNIQUES IN MACHINE TOOL EVALUATION AND PROCESS QUALITY CONTROL.
H. A. Fell. Dec 72, 10p CONF-721130-14
Contract W-7405-ENG-26
From Precision Machining And Gaging Conference, Oak Ridge, Tn (14 Nov 1972).

Descriptors: *Machine tools.

For abstract, see NSA 27 06, number 14477.

13J. Marine Engineering

AD-757 047 PC$3.00/MF$0.95
Center for Naval Analyses Arlington Va Naval Warfare Analysis Group
THE VARI-PURPOSE CARRIER (CVV).
Project strike document,
H. A. Linstone, J. A. Saxton, L. T. Ravenscroft, and J. J. Wade. 12 Dec 63, 17p Rept no. NWAG-Research Contrib-36

Descriptors: (*Aircraft carriers, Mission profiles), Amphibious operations, Close support, Naval operations, Military tactics, Antisubmarine warfare, Combat readiness.
Identifiers: CVV vessels, Strike project.

The purpose of this report is to examine the concept of using a single suitably-designed surface carrier to serve as the mobile base for a variety of missions, involving various mixes of aircraft and troops. (Author)

AD-757 048 PC$3.00/MF$0.95
Center for Naval Analyses Arlington Va Naval Warfare Analysis Group
SOME COMMENTS ON A PROPOSED NUCLEAR POWERED CARGO SHIP.
A. B. Moore. 15 Jan 64, 32p Rept no. NWAG-Research Contrib-41

Descriptors: (*Cargo ships, Nuclear powered vessels), Merchant vessels, Costs, Shipping (Marine).
Identifiers: Cost analysis.

Recently it has been proposed that the U.S. Government develop small nuclear reactors for use in high-speed, general cargo vessels. It has been urged that, if the U.S. will bear the development costs, private ship operators will buy and operate the ships, and that this will serve the national interest as it relates to maritime matters. This paper argues that evidence presented by one

proponent of the high-speed nuclear system is either based on misleading cost estimates, or not suggestive of commercial benefit from the development of the proposed reactors. In either case, the argument for development of the reactors is reduced in force. Further, it is argued that no convincing case has been made for any net benefits for this country to be derived from nuclear-powered cargo carriers. (Author)

AD-757 096 PC$3.00/MF$0.95
New Hampshire Univ Durham
SUBMERSIBLE MANEUVERING.
Technical rept. 1 Sep 72-1 Feb 73,
C. K. Taft. 1 Feb 73, 30p
Contract N00014-67-A-0158, ARPA Order-1958

Descriptors: (*Shrouded propellers, Performance (Engineering)), (*Underwater vehicles, *Underwater propulsion), Flow fields, Flow separation, Wake, Shroud rings, Fluid mechanics, Ducts, Test methods.
Identifiers: Submersibles.

The report presents experimental data obtained from tests performed on various configurations of a shrouded propeller used for submersible propulsion.

AD-757 175 PC$3.00/MF$0.95
Coast Guard Washington D C Applied Technology Div
PRELIMINARY ANALYSIS OF TANKER COLLISIONS AND GROUNDINGS.
Technical rept. Aug-Nov 70,
David M. Bovet. Jan 73, 48p*

Descriptors: (*Ships, *Accidents), (*Tankers, Accidents), Computer programs, Analysis, Penetration, Velocity, Damage, Harbors, Momentum, Energy.
Identifiers: *Collision research, *Oil pollution control, Water pollution abatement, FORTRAN, Design criteria.

The report presents the results of a preliminary analysis of tanker collision and grounding data. Collisions are analyzed in terms of vessel size, vessel speed at time of occurrence, angle of collision, depth of penetration, and geographical location of collision. Correlations of penetration depth with striking ship speed, momentum, and energy are attempted. A brief analysis of tanker groundings is presented. Witin the small sample of events available for collisions and groundings, certain preliminary trends and conclusions relating to pollution control through ship design are drawn. (Author)

AD-757 176 PC$4.50/MF$0.95
Teledyne Materials Research Waltham Mass
INSTRUMENTATION OF M/V STEWART J. CORT. CALIBRATION AND FIRST VOYAGE.
Technical rept. Apr-May 72,
James W. Wheaton, and I. J. Walters. 21 Jul 72,
67p* Rept no. E-1419 (c)
Contract DOT-CG-13188-A
See also Report no. E-1527 (a) dated 14 Jul 72, AD-757 179.

Descriptors: (*System test vessels, Great Lakes), (*Merchant vessels, Stresses), Bending, Ship hulls, Cargo ships, Calibration, Standards, Strain gages, Ballast, Statistical data, Coast Guard research.
Identifiers: *Stewart J. Cort vessel.

The stress gage transducers installed aboard the M/V STEWART J. CORT were calibrated over the night of April 11, 1972. Results indicated that measured stress values should be increased by about 20%. The first voyage of the CORT took place between May 1 and May 9, and resulted in the acquisition of some springing data with a maximum value of 5910 psi peak-to-trough. Weather conditions, however, were relatively mild, and no long-period stresses were recorded. (Author)

AD-757 177 PC$3.00/MF$0.95
Webb Inst of Naval Architecture Glen Cove N Y
FEASIBILITY STUDY OF SPRINGING MODEL TESTS OF A GREAT LAKES BULK CARRIER.
Technical rept. Jan-Jul 72,
Dan Hoffman, and Richard Van Hooff. 14 Jul 72, 43p
Contract DOT-CG-23027-A

Descriptors: (*Ship hulls, Vibration), (*Cargo ships, Ship hulls), Stresses, Deformation, Resonant frequency, Damping, Ship models, Model tests, Feasibility studies.
Identifiers: *Ore carriers.

A feasibility study is described in which springing bending moment response of a 1000-ft. ore ship model was measured. Regular waves of length between 6 and 14 inches were generated to excite the 1:144-scale model hinged at midships over a range of foreard speeds between 1.0 and 4.5 ft./sec.; significant springing was obtained under resonant conditions which corresponded to 39.6 and 19.5 rad./sec., respectively, for each of the connecting beams used. Analytical solution of the model springing phenomenon is also given using Goodman's theory, and correlation between experimental and theoretical results is shown to be encouraging. (Abstract Modified Abstract)

AD-757 179 PC$3.00/MF$0.95
Teledyne Materials Research Waltham Mass
CALIBRATION AND FIRST VOYAGE SS CHARLES M. BEEGHLY.
Technical rept. May-Jul 72,
James W. Wheaton. 14 Jul 72, 49p* Rept no. E-1527 (a)
Contract DOT-CG-22845-A
See also AD-757 176.

Descriptors: (*Ship hulls, Stresses), (*Cargo ships, Standards), (*System test vessels, Great Lakes), Bending, Loading (Mechanics), Calibration, Strain gages, Ballast.
Identifiers: *Charles M. Beeghly vessel, Dimensions.

The report describes a temporary instrumentation system installed on the STR. CHARLES M. BEEGHLY to measure longitudinal vertical hull bending stresses during the first voyage after lengthening to 806 feet overall. A calibration was performed the night before departure which verified that the measurements correspond closely with calculated values. Data were taken during the first loading at Taconite Harbor which show that bending stresses are well within the limits established by the loading manual. During the only period of bad weather encountered on the first voyage, springing stresses having a maximum peak-to-trough excursion of approximately 4,000 psi were measured. (Author)

AD-757 285 Not available NTIS
British Ship Research Association Wallsend (England) Wallsend Research Station
JOURNAL OF ABSTRACTS OF THE BRITISH SHIP RESEARCH ASSOCIATION. VOLUME 28, NUMBER 1, ABSTRACTS NO. 33,565-33,746.
Jan 73, 110p
See also Volume 27, Number 12 dated Dec 72, AD-754 695.
Availability: Pub. in Jnl. of Abstracts, v28 n1 p1-109 Jan 73.

Descriptors: (*Marine engineering, Abstracts), Bibliographies, Design, Construction, Hydrodynamics, Ship structural components, Marine engines, Corrosion, Marine safety equipment, Fouling, Economics, Navigation, Automation, Cargo, Shipyards, Great Britain.

Contents: Ship design; Ship construction; Ship machinery and systems; Ship operation; Ocean engineering.

AD-757 286 Not available NTIS
British Ship Research Association Wallsend (England) Wallsend Research Station
JOURNAL OF ABSTRACTS OF THE BRITISH SHIP RESEARCH ASSOCIATION. VOLUME 28, NUMBER 2, ABSTRACTS NO. 33,747-33,931.
Feb 73, 83p
See also Volume 28, Number 1 dated Jan 73, AD-757 285.
Availability: Pub. in Jnl. of Abstracts, v28 n2 p110-190 Feb 73.

Descriptors: (*Marine engineering, Abstracts), Bibliographies, Design, Construction, Hydrodynamics, Ship structural components, Marine engines, Corrosion, Marine safety equipment, Fouling, Economics, Navigation, Automation, Cargo, Shipyards, Great Britain.

Contents: Ship design; Ship construction; Ship machinery and systems; Ship operation; Ocean engineering.

AD-757 287 Not available NTIS
British Ship Research Association Wallsend (England) Wallsend Research Station
JOURNAL OF ABSTRACTS OF THE BRITISH SHIP RESEARCH ASSOCIATION. VOLUME 28, NUMBER 3, ABSTRACTS NO. 33,931-34,094.
Mar 73, 63p
See also Volume 28, Number 2 dated Feb 73, AD-757 286.
Availability: Pub. in Jnl. of Abstracts, v28 n3 p191-251 Mar 73.

Descriptors: (*Marine engineering, Abstracts), Bibliographies, Design, Construction, Hydrodynamics, Ship structural components, Marine engines, Corrosion, Marine safety equipment, Fouling, Economics, Navigation, Automation, Cargo, Shipyards, Great Britain.

Contents:
Ship design;
Ship construction;
Ship machinery and systems;
Ship operation;
Ocean engineering.

AD-757 339 PC$3.00/MF$0.95
Naval Ship Research and Development Center Bethesda Md
A FEASIBILITY STUDY OF A STABLE MOBILE OCEAN PLATFORM AS A NAVAL BASE.
Final rept.,
Alan C. M. Lin. Feb 73, 84p Rept no. NSRDC-3743

Descriptors: (*Floating docks, Feasibility studies), (*Naval operations, Floating docks), Structural parts, Ship decks, Supports, Floating bodies, Bulkheads, Loading (Mechanics), Structural properties, Costs.
Identifiers: Floating naval bases, Ocean platforms, Design criteria.

A feasibility study is presented, concerning the proposed use of a stable ocean platform as a U.S. foreign naval base. To determine and evaluate the technology necessary to design, produce, and deploy such a base, technical considerations such as wave response, stability, power required for station keeping, structural loads, and materials were studied for several design concepts. Life cycle costs, methods of construction, deployment, and assembly were also evaluated. The required technology is considered to be within the state of the art. (Author)

AD-757 340 PC$3.00/MF$0.95
Naval Ship Research and Development Center Annapolis Md
IMPROVED LONG-TERM PRESERVATION SYSTEM FOR SHIPS' TOPSIDES AND SUPERSTRUCTURES.
Final rept. Jul 70-Oct 72,
Harold E. Achilles. Feb 73, 143p* Rept nos. NSRDC-3927, NSRDC-28-550

Descriptors: (*Ships, Preservation), Encapsulation, Inflatable structures, Nylon, Plastic paints, Polyethylene plastics, Corrosion inhibition, Synthetic rubber, Cost effectiveness.
Identifiers: Hypalon.

A prototype air-supported structure, within which dehumidified air is circulated, was installed over the topsides of USS BETELGEUSE (AK 260). By maintaining relative humidity of the air at approximately 35% within the air-supported structure, deterioration of topside superstructure, machinery, and other gear will be minimized. Improved corrosion prevention techniques for the preservation of shipboard machinery and gear were developed. A time-cost study comparing the current method with the new topside cover method of ship preservation has been made. Over the entire inactivation/reactivation cycle, significant time savings are indicated for the topside cover procedure, especially during the ship reactivation phase. However, estimated costs of the two methods are similar. (Author Modified Abstract)

AD-757 348 PC$3.00/MF$0.95
Catholic Univ of America Washington D C Dept of Civil and Mechanical Engineering
A SURVEY OF ANALYTICAL METHODS FOR DYNAMIC SIMULATION OF CABLE-BODY SYSTEMS,
Young-il Choo, and Mario J. Casarella. Mar 73, 42p Rept no. 73-1
Contract N00014-68-A-0506-0001

Descriptors: (*Cables (Mechanical), Equations of motion), Simulation, Mooring, Towing cables, Mathematical models, Oscillation, Hydrodynamics, Numerical analysis, Buoys, Marine engineering, Reviews.
Identifiers: Finite element analysis, Method of characteristics.

The purpose of the report is to review the available methods for analyzing the dynamic motions of cable-body combinations used as either mooring or towing systems. These methods are grouped according to the manner, by which the cable, as a component in the whole system is simulated. The central idea, merits, and demerits of each group of methods are presented. Minor differences between the methods belonging to the same group are not discussed. An introduction to various types of cable-body systems and a discussion of the motivations for dynamic analysis of these systems are initially presented. (Author)

AD-757 363 PC$3.00/MF$0.95
Stevens Inst of Tech Hoboken N J Davidson Lab
SOME ADDITIONAL STUDIES OF THE APPLICATION OF CROSS-BI-SPECTRAL ANALYSIS TO SHIP RESISTANCE IN WAVES.
Final rept.,
J. F. Dalzell. Dec 72, 27p Rept no. SIT-DL-72-1641
Contract N00014-67-A-0202-0025

Descriptors: (*Ship hulls, *Ocean waves), Spectrum analyzers, Time series analysis, Sampling, Graphics.
Identifiers: Spectrum analysis.

The objective of the present work was to investigate the sampling variability of estimates of the added resistance operator which are made via cross-bi-spectral analysis. The work involved the simulation of large samples from a process similar to that of added resistance, as well as the analysis of these samples. Direct comparisons of the results with the known answer for the simulated process imply that the previously developed methods are correct, but that the required sample of random input and the resulting output needs to be longer than originally assumed. (Author)

AD-757 645 PC$3.00/MF$0.95
Naval Ship Research and Development Center Bethesda Md
BENDING FLUTTER AND TORSIONAL FLUTTER OF FLEXIBLE HYDROFOIL STRUTS.
Research and development rept.,
Peter K. Besch, and Yuan-Ning Liu. Feb 73, 64p Rept no. NSRDC-4012

Descriptors: (*Hydrofoils, Flutter), (*Hydrofoil boats, Hydrofoils), Bending, Oscillation, Hydrodynamic configurations, Fluid dynamic properties, Loading (Mechanics), Numerical analysis.
Identifiers: Hydrofoil struts, Hydroelasticity.

A large body of experimental and theoretical flutter results for hydrofoil struts were analyzed to determine significant characteristics. Flutter was found to occur in two different structural mode shapes, corresponding to a predominantly bending mode and a predominantly torsional mode, respectively. The flutter mode shape was related to the vibration mode shapes and the generalized mass ratio of the strut at zero speed. The behavior of the hydroelastic modes of typical struts as a function of speed was investigated by using a strip theory with three-dimensional loading modifications. Flutter predictions for struts which underwent flutter in the torsional mode were usually conservative and predicted the correct mode shape. (Author Modified Abstract)

AD-757 674 PC$4.00/MF$0.95
Naval Intelligence Support Center Washington D C Translation Div
SOVIET SHIPBUILDING. NUMBER 10, 1972. ABSTRACTS AND TRANSLATIONS.
22 Feb 73, 39p Rept no. NISC-Trans-3410
Trans. from Sudostroenie (USSR) n10 15-17, 27-32, 40-41, 65-66, 69 1972.

Descriptors: (*Marine engineering, Reports), (*Ships, Construction), Merchant ships, Structural properties, Standardization, Thermodynamics, Steam turbines, Costs, Steam power plants, Shipyards, Engine noise, Ship noise, Automation, Propellers (Marine), Hydraulic systems, USSR.
Identifiers: Translations.

Contents: Reliability of numerical computations in ship structural mechanics; Impriving the cost effectiveness of marine simple thermodynamic cycle turbine power plants; Study of the cooling of marine steam-turbine casings; Calculating noise levels in engine rooms with trunks; Wind measuring and signalling device; Soviet shipbuilding innovations on the world licensing; Leningrad oblast conference of the scientific and technical society of the shipbuilding industry; Conference on ship propellers; Scientific and technical conference on hydraulic drives and automatic hydraulic systems.

13K. Pumps, Filters, Pipes, Fittings, Tubing, and Valves

AD-757 431 PC$3.00/MF$0.95
Virginia Polytechnic Inst Blacksburg Dept of Mechanical Engineering
ISOLATION OF PIPING FROM PUMP VIBRATIONS,
L. D. Mitchell. Nov 72, 105p*
Contract N62470-72-C-1093
Revision of report dated Jun 72.

Descriptors: (*Pipes, *Vibration isolators), (*Pumps, Vibration), Expansion joints, Shock absorbers, Flexible couplings, Anchors (Structural), Noise, Acoustic impedance, Stress (Physiology), Mathematical models, Damping, Human engineering, Specifications.
Identifiers: Noise pollution, Noise transmission, Design criteria.

When piping is connected to pumping systems, unwanted vibration and/or noise can be transmitted from the pump to the piping and ultimately to an observer in a working or living space as noise. The low frequency vibration induced in piping can be large and can cause damage and pipe failure. The objective of the report was to provide guidelines for effective selection and installation of flexible pipe connectors or resilient pipe hangers in an effort to minimize or eliminate this problem.

AD-757 650 PC$3.00/MF$0.95
Office of Naval Research London (England)
JET PUMPS AND EJECTORS - APPLICATION OF LIQUID/TWO PHASE EJECTION IN DESALINATION.
Conference rept.,
David F. Dyer. 28 Feb 73, 18p Rept no. ONRL-C-6-73

Descriptors: (*Jet pumps, *Desalination), Performance (Engineering), Symposia, Steam, Design, Fluid mechanics, Great Britain.

The report discusses the papers presented at a symposium entitled 'Jet Pumps and Ejectors.3 Particular emphasis is given to a paper dealing with a jet pump using liquid water as a primary jet and steam-water mixture as a secondary jet. The application of such a device to desalination is described and analyzed. (Author)

GEAP-13897 PC$3.00/MF$0.95
General Electric Co., Sunnyvale, Calif. Breeder Reactor Dept.
STRESS-RUPTURE BEHAVIOR OF AUSTENITIC STAINLESS STEEL TUBING. INFLUENCE OF COLD WORK AND EFFECT OF SURFACE DEFECTS.
T. Lauritzen. Jan 72, 32p
Contract AT (04-3)-189

Descriptors: *Stainless steel.

For abstract, see NSA 27 06, number 12472.

RISO-272 PC$3.00/MF$0.95
Danish Atomic Energy Commission, Risoe. Research Establishment.
METHODS OF FABRICATION AND MEASUREMENT OF ARTIFICIAL DEFECTS AS CALIBRATION STANDARDS FOR ULTRASONIC INSPECTION OF THIN-WALLED TUBING.
J. Domanus. Sep 72, 24p
U. S. Sales only

Descriptors: *Tubes, *Ultrasonic testing.

For abstract, see NSA 27 06, number 11932.

13L. Safety Engineering

N73-16097 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
A METHOD FOR DEFINING DOWN-WIND EVACUATION AREAS FOR TRANSPORTATION ACCIDENTS INVOLVING TOXIC PROPELLANT SPILLS.
R. D. Siewert. 1972, 15p NASA-TM-X-68188, E-7320
Conf- Presented At 1972 Joint Army Navy Nasa Af (Jannaf)Prop. Meeting, New Orleans, La., 27-29 Nov. 1972

Descriptors: *Evacuating (transportation), *Propellant evaporation, *Residential areas, *Spilling, *Toxicity and safety hazard, Air flow, Air pollution, Environmental control, Evaporation rate, Health physics, Plumes.

For abstract, see STAR 11 07.

PB-214 743/7 PC$4.50/MF$0.95
National Transportation Safety Board, Washington, D.C.
REDUCED-VISIBILITY (FOG) ACCIDENTS ON LIMITED-ACCESS HIGHWAYS.
Special study,

15 Nov 72, 53p* NTSB-HSS-72-4

Descriptors: (*Motor vehicle accidents, *Accident investigations), (*Fog, Limited access highways), Visibility, Collision research, Education, Law enforcement, Illuminating.

The National Transportation Safety Board has undertaken the investigation of several highway accidents in which the presence of fog was a contributing factor. The study is the culmination of what the Safety Board has learned through its accident investigations, public hearing, fog symposium, and review of pertinent research studies and literature relative to reduced visibility problems caused by fog. The study reviews the various approaches that have been taken to prevent fog accidents or that have a bearing on the problem; namely, driver education, fog detection and guidance systems, environmental control, highway department procedures, vehicle and highway lighting, enforcement; and postaccident control. In light of this finding, the study includes recommendations intended to alleviate the problem from several directions, namely, driver education, police-highway department procedures for closing highways, enforcement of the basic speed rule as related to fog accidents, mutual-assistance pacts for postaccident control of accidents, implementation of Highway Safety Programs Standards and Federal Highway Administration plans to develop highway guidance systems.

PB-216 059/6 PC$3.00/MF$0.95
Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
TRI-LEVEL ACCIDENT INVESTIGATION SUMMARIES. LEVEL 3A - INJURY CAUSATION. VOLUME 1, NUMBER 6.
Summary rept.
Sep 72, 197p* DOT-HS-600 981
Contract FH-11-7098
See also PB-214 755.

Descriptors: (*Motor vehicle accidents, *Accident investigations), Collision research, Automobile bodies, Injuries, Accident prevention, Safety engineering, Design.

The report briefly introduces and describes the Tri-Level Accident Investigation concept. Basically, three levels of information are collected: (1) exposure and accident rate information; (2) accident information on a large sample of accidents not normally collected by the police; (3) multidisciplinary in-depth information collected on a small sample of accidents by a team of professionals. The report contains Level 3A accident summaries from the Tri-Level Study being conducted by Cornell Aeronautical Laboratory (CAL). These summaries are brief descriptions of injury-producting accidents investigated by the CAL Team to determine the injuries incurred and identify the specific interior components which caused such injuries. The volume contains summaries of 50 Injury Causation cases. (Author)

PB-216 328/5 PC$3.00/MF$0.95
California Univ., Berkeley. Div. of Structural Engineering and Structural Mechanics.
WATER FILLABLE POLYMERS - ABLATIVE MATERIAL FOR FIRE RESISTANCE.
Final rept.,
James Phil Davidson, and Robert Brady Williamson. 8 Mar 73, 52p NSF-72-33-GI-43

Descriptors: (*Fire walls, *Ablation), (*Sandwich panels, Fire walls), Water storage, Plastics, Tests, Ablation, Fire resistance.

The report presents the results and conclusions of investigations into the nature and fire resistance applications of water fillable polymers. The potential of water fillable polymers, hereafter called W.F.P., as a fire barrier material is demonstrated by the results of fire tests conducted on small wall panels. These results are presented. An explanation, based on fire test data and scanning electron micrographs, of how W.F.P. works as a fire barrier material is also given along with results of flame spread tests conducted with a small flame spread tunnel. (Author Modified Abstract)

PB-217 107/2 PC$3.00/MF$0.95
Michigan Univ., Ann Arbor. Highway Safety Research Inst.
DEPLOYABLE HEAD RESTRAINTS.
Final rept. 15 Jan 72-1 Feb 73,
J. F. Hilyard, J. W. Melvin, and J. H. McElhaney. 31 Jan 73, 168p DOT-HS-800 802
Contract DOT-HS-031-2-281

Descriptors: (*Safety devices, *Automobiles), (*Head (Anatomy), *Protectors), Constraining, Inflatable structures, Concepts, Shape, Optimization, Design, Collisions, Crash tests, Evaluation, Safety engineering.
Identifiers: Automobile passenger head restraints, Deployable head restraints.

The object has been to extend and further develop the concept of the inflating head restraint system for passenger automobiles, with special emphasis on the development of totally inflating systems with self-contained fore-and-aft stiffness, and development of optimum head restraint shapes for oblique as well as direct rear end impacts.

PB-217 108/0 PC$3.00/MF$0.95
Nebraska State Office of the Adjutant General, Lincoln.
CONSOLIDATED SYSTEMS OF EMERGENCY SERVICES. (PROJECT 20/20).
Final rept. May 68-Mar 71,
Donald G. Penterman. 1 Mar 71, 275p DOT-HS-800 589
Contract FH-11-6854

Descriptors: (*Medical services, *Highways), (*Motor vehicle accidents, Medical services), (*Safety engineering, Highways), Information systems, Telecommunication, Ambulances, Nebraska, Evaluation.
Identifiers: *Emergency medical care, *Emergency highway services.

The purpose of the demonstration project was to develop a flexible, comprehensive methodology for evaluating and improving emergency medical service systems on the highways of the State of Nebraska, and implement a total system concept which would demonstrate the maximum use of multidisciplinary subsystem for rapid and effective response to the urgent needs of highway sick and injured, and to establish an emergency notification, dispatch, and assistance program for highway accident victims. The research program consisted of eight elements for detailed study. They were: notifications, video tape documentation; ambulance attendant and training; one county road equipment test; computer assist information system; comparitive analysis, air and ground ambulances; vital function telemetry; and model demonstrator.

PB-217 232/8 MF$0.95
Boston Univ., Mass. Accident Research Team.
MULTIDISCIPLINARY ACCIDENT INVESTIGATIONS REPORTS.
Rept. no. 3 (Final) 1 Jul 69-31 Aug 70,
Parker A. Glass. Jan 72, 208p DOT-HS-800 658
Contract FH-11-7402

Descriptors: (*Motor vehicle accidents, *Accident investigations), Collision research, Injuries, Autopsy, Automobile bodies, Accident prevention, Safety engineering, Design standards, Safety devices.

The report analyzes 39 multidisciplinary highway accident investigations conducted under contract with U.S. Department of Transportation, National Highway Traffic Safety Administration. On-scene and subsequent investigations of 39 accidents (37 with resulting fatalities), from 7/1/69-8/31/70 involving 63 vehicles and a total of 100 occupants. A description of methodology is given. Trends are discussed, standards are evaluated and conclusions and recommendations are given. Copies of the summary and collision diagram for each of the 39 cases are included. (Author)

13M. Structural Engineering

AD-757 112 PC$3.00/MF$0.95
Jacobs Associates San Francisco Calif
GROUND SUPPORT PREDICTION MODEL.
Semi-annual rept. of Phase 2, 7 Jun-30 Nov 72,
George E. Wickham, and Henry R. Tiedemann. 30 Nov 72, 41p Rept no. JA-TR-120
Contract HO22075, ARPA Order-1579
See also report dated Apr 72, AD-743 100.

Descriptors: (*Structural geology, Mathematical prediction), (*Underground structures, Construction), Supports, Rock (Geology), Joints, Faults (Geology), Correlation techniques, Questionnaires.
Identifiers: *Rock structure rating, *Tunnel excavation, Evaluation, Rock bolts, Rapid excavation.

The report describes the second phase of a two year research project to develop a tunnel support prediction model based on known geologic factors determined by pre-construction geologic investigation. Phase I was fully described in the final report for contract HO210038. Under phase I a detailed study was made of 33 case study tunnels, comparing geologic and construction factors with actual support systems used. From this a tentative empirical relationship was suggested. This concept called the Rock Structure Rating (RSR) places numerical ratings on geologic factors, the sum of which gives a relative index of the ability of the rock to support itself around a tunnel opening. The work described in this report covers the first six months of phase 2, where the work previously performed is being extended with additional empirical, theoretical and experimental capability to confirm, expand or modify the ground support prediction model. Five additional case studies are described and compared to the prediction model. (Author Modified Abstract)

AD-757 536 PC$3.00/MF$0.95
Delaware Univ Newark Dept of Mechanical and Aerospace Engineering
STRESSES IN CIRCULAR CYLINDRICAL SHELLS OF COMPOSITE MATERIALS SUBJECTED TO LOCALIZED LOADS.
Howard S. Kliger, George Z. Forristall, and Jack R. Vinson. Jan 73, 80p Rept no. MAE-TR-161
AFOSR-TR-73-0494
Grant AF-AFOSR-1760-69

Descriptors: (*Structural shells, *Stresses), Composite materials, Cylindrical bodies, Deformation, Computer programs.
Identifiers: *Cylindrical shells, SHELL computer program, FORTRAN 4 programming language, FORTRAN.

Methods of analysis are developed to provide the stresses (both bending and membrane) and deformations in specially orthoropic circular cylindrical shells subjected to localized loads. An accurate shell theory is employed which includes the effects of orthotropy and transverse shear deformation. The governing differential equations are obtained, and are transformed into a set of algebraic equations through expanding all displacements, rotation, and the localized loading in a doubly infinite series in the shell coordinates. A computer program is formulated, and included, to perform numerical calculations easily using the analytic solutions. (Author Modified Abstract)

AD-757 711 PC$3.00/MF$0.95
Naval Civil Engineering Lab Port Hueneme Calif

SEAFLOOR FOUNDATIONS: ANALYSIS OF CASE HISTORIES. SUPPLEMENT.
Technical rept. Jul 70-Jun 72,
D. A. Raecke. Jan 73, 20p* Rept no. NCEL-TR-731-S
Supplement to Rept. no. NCEL-TR-731, AD-728 014.

Descriptors: (*Ocean bottom, Foundations (Structures)), (*Foundations (Structures), Underwater), Towers, Deep water, Construction, Underwater sound equipment, Networks, Stabilized platforms, Monitors, Soil mechanics, Underwater vehicles, Deep submergence.
Identifiers: *Underwater foundations, Offshore platforms, Manned underwater stations.

Twenty-six seafloor foundation case histories are summarized in a continuing effort by NCEL to collect and evaluate foundation design foundation. Analysis of such histories for both successful and unsuccessful installations is of significant value in developing design guidelines for future seafloor structures. The installations analyzed included offshore towers, habitats, acoustic arrays, and numerous other submerged structures. The case histories have two distinctive features-- installations applied only light-to-moderate foundation bearing pressures. Because of the low bearing pressures, few major foundation problems were reported. (Author)

PB-215 823/6 PC$6.00/MF$0.95
California Inst. of Tech., Pasadena. Earthquake Engineering Research Lab.
ANALYSIS OF THE EARTHQUAKE RESPONSE OF A NINE-STORY STEEL FRAME BUILDING DURING THE SAN FERNANDO EARTHQUAKE.
Research rept.,
John H. Wood. Oct 72, 154p* EERL-72-04
Grant NSF-GK-28098X

Descriptors: (*Buildings, Dynamic structural analysis), (*Earthquakes, Damage), Spectrum analysis, Earth movements, Dynamic response, Steel structures, Vibration, Damping, Fourier analysis.
Identifiers: Earthquake engineering, San Fernando earthquake.

A study has been made of the earthquake response of the nine-story steel frame Building 180, located at the C.I.T. Jet Propulsion Laboratory, Pasadena, during the San Fernando earthquake of February 9, 1971, which was motivated by the likelihood that an earthquake similar to the February 9, 1971, shock could occur close to the JPL grounds with consequent very strong ground shaking. The analysis throws light on the actual dynamical properties of the building during the earthquake, and demonstrates that it is possible to make accurate calculations of building motions during earthquakes when the ground motion is specified. Periods of the lower modes from pre- and post-earthquake tests are compared with those during the earthquake, and calculations are made of damping ratios, roof accelerations, maximum stresses, and Fourier spectra. (Author)

PB-216 070/3 PC$6.00/MF$0.95
Washington Univ., Seattle.
PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON MICROZONATION FOR SAFER CONSTRUCTION RESEARCH AND APPLICATION. VOLUME I, HELD AT SEATTLE, WASHINGTON, ON 30 OCTOBER-3 NOVEMBER 1972.
Oct 72, 432p*
Sponsored in part by National Science Foundation, Washington, D.C. See also Volume 2, PB-216 071.

Descriptors: (*Earthquake resistant structures, *Meetings), Land surveys, Earthquakes, Seismic epicenter, Geological faults, Soil mechanics, Foundations, Structural design, Urban planning, Seismographs, Risk, Abstracts.
Identifiers: *Microzonation, *Earthquake engineering, Foundation engineering, Earthquake prediction.

The Seattle Conference on Microzonation brought together those who are interested in the basic aspects of science and the engineers who are involved in the application of science, combining the talents of both in producing a rational concept for the design of earthquake-resistant structures in regions made hazardous by Nature. (Author modified abstract)

PB-216 071/1 PC$6.00/MF$0.95
Washington Univ., Seattle.
PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON MICROZONATION FOR SAFER CONSTRUCTION RESEARCH AND APPLICATION, VOLUME II, HELD AT SEATTLE, WASHINGTON, ON 30 OCTOBER-3 NOVEMBER 1972.
1972, 440p
Sponsored in part by National Science Foundation, Washington, D.C. See also Volume I, PB-216 070.

Descriptors: (*Earthquake resistant structures, *Meetings), Land surveys, Earthquakes, Seismic epicenter, Geological faults, Soil mechanics, Foundations, Structural design, Urban planning, Seismographs, Risk, Abstracts.
Identifiers: *Microzonation, *Earthquake engineering, Foundation engineering, Earthquake prediction.

The report contains papers presented at a symposium relative to earthquake engineering, mapping of earthquake regions, and soil mechanics and foundation engineering in areas of seismic activity.

TT-70-55113/5-6 PC$3.00
Department of Housing and Urban Development, Washington, D.C. Office of International Affairs.
BUILDING REVIEW. VOLUME 42, NUMBERS 5, 6 1970.
1972, 231p
Trans. of Przeglad Budowlany (Poland) v42 n5/6 1970, by Jerry Bachrach. The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Construction industry, *Poland), Reviews, Construction management, Masonry, Buildings, Prefabrication, Concretes, Construction equipment.

The report describes construction methods, materials, and equipment used for various building projects in Poland.

14. METHODS AND EQUIPMENT

14B. Laboratories, Test Facilities, and Test Equipment

AD-757 196 PC$3.00/MF$0.95
Arnold Engineering Development Center Arnold Air Force Station Tenn
UPWASH INTERFERENCE ON A SYMMETRICAL WING IN A RECTANGULAR VENTILATED WALL WIND TUNNEL: PART I. DEVELOPMENT OF THEORY.
Final rept. Oct 71-May 72,
E. M. Kraft. Mar 73, 74p Rept no. AEDC-TR-72-187
Prepared in cooperation with ARO, Inc., Tullahoma, Tenn. Rept. no. ARO-PWT-TR-72-162.

Descriptors: (*Swept-back wings, Model tests), (*Wind tunnels, Reliability), Interference, Wind tunnel models, Walls, Aerodynamic slots, Porous materials, Subsonic characteristics, Fourier analysis, Transformations (Mathematics), Mathematical models, Theory.
Identifiers: *Upwash, *Ventilated wall wind tunnels.

The wind tunnel boundary upwash interference on a symmetrical finite wing of arbitrary lift distribution is calculated in a rectangular test section with solid vertical walls and ventilated (porous-slotted) horizontal walls. The interference is found by applying linearized theory for a compressible medium at subsonic speed to the boundary value problem. The theory uses an image method in addition to Fourier transforms with an equivalent homogeneous boundary condition on the ventilated wall. A treatment of the far downstream end condition consistent with the Fourier transform method is presented. (Author Modified Abstract)

AD-757 197 PC$3.00/MF$0.95
Arnold Engineering Development Center Arnold Air Force Station Tenn
MODEL INDUCTION TEST FACILITY CAPABILITY FOR TESTING TURBOFAN ENGINES.
Final rept. 6 Jul 71-30 Jun 72,
James W. Hale. Mar 73, 32p Rept no. AEDC-TR-73-10
Prepared in cooperation with ARO, Inc., Tullahoma, Tenn. Rept. no. ARO-ETF-TR-72-189.

Descriptors: (*Test facilities, Design), (*Turbofan engines, Captive tests), Exhaust diffusers, Jet pumps, Subsonic flow, Nozzle throats, Statistical data.
Identifiers: Sea level tests.

The objective of this model study was to determine the potential for testing very large thrust, high-bypass-ratio, turbofan engines at conditions simulating flight Mach numbers of 0.4 to 0.6, sea level, by use of a jet pumped air supply system. The simulation of low altitude, subsonic operation of a large, high-bypass-ratio, turbofan engine in ground test facilities requires extremely large airflows. This airflow, even at relatively low pressure, cannot be provided by existing test facilities for engines having thrust levels of 60,000 to 100,000 lbf. The jet pumped air supply is therefore a very attractive potential facility. (Author Modified Abstract)

AD-757 210 PC$3.00/MF$0.95
Technology Inc Dayton Ohio
EVALUATION OF THE NASA ELECTRONIC STRAIN-LEVEL COUNTER AS A FATIGUE DAMAGE MONITOR.
Final rept. Apr-Dec 72,
Larry E. Clay, and Sandra K. Buehler. Jan 73, 50p
AFFDL-TR-72-135
Contract F33615-72-C-1249

Descriptors: (*Naval aircraft, Fatigue (Mechanics)), (*Fatigue (Mechanics), Monitors), (*Strain gages, Performance (Engineering)), Attack bombers, Installation, Electronic recording systems, Strain (Mechanics), Streases.
Identifiers: A-37 aircraft, A-37B aircraft.

The NASA Electronic Strain-Level Counter was evaluated by analyzing the data recorded during 26 flights on an A-37B aircraft. The strain-level counter output was compared with data from a collocated strain gage recorded by a digital magnetic tape recorder. Fatigue damages were computed for several hypothetical strain-level counters to determine their suitability as fleet damage monitoring devices. (Author Modified Abstract)

AD-757 327 PC$3.00/MF$0.95
Naval Submarine Medical Research Lab Groton Conn
MOBILE PSYCHOACOUSTIC LABORATORY.
Interim rept. no. 3,

Paul F. Smith. 8 Feb 72, 12p Rept no. NSMRL-699

Descriptors: (*Psychoacoustics, Laboratories), Mobile, Audiometry, Naval research.

A mobile laboratory that provides an adequate environment for a variety of psychoacoustic measurements has been constructed. The mobile unit will be used for psychoacoustic and bioacoustic field studies. The laboratory houses a 10-man audiometric booth. In addition to space within the booth, there are in excess of 120 feet of floor space available for installation of equipment. Most clinical or experimental audiometric and otologic procedures and group audiometric tests can be administered within the laboratory. Cables may run to apparatus set up away from the trailer permitting detailed environmental noise analyses, acquisition of bioacoustical data, conducting underwater analyses, and communications experiments, etc. (Author)

AD-757 527 PC$3.00/MF$0.95
Oxford Univ (England) Dept of Engineering Science
A DOUBLE-PULSE TORSIONAL HOPKINSON-BAR TECHNIQUE FOR INVESTIGATING STRAIN-RATE EFFECTS.
Interim rept. Mar-Oct 72,
John D. Campbell. Nov 72, 24p Rept no. OUEL-1036/72 AFML-TR-72-207
Grant AF-AFOSR-2056-71

Descriptors: (*Strain gages, Design), (*Metals, *Rheology), Strain (Mechanics), Shear stresses, Mechanical waves, Propagation, Plasticity, Creep, Test methods.
Identifiers: Torsion tests.

A brief description is given of an apparatus by means of which a torsional wave can be generated which exhibits a double-step structure. Each step has a rise time of order 40 microseconds, and the time between them is about 150 microseconds; three different bar systems have been built, giving respectively 4.6, 6.5 and 10.0 as the nominal ratio of the amplitude of the second step to that of the first. By means of this apparatus, a short thin-walled tubular specimen can be subjected to a sudden change in strain rate at rates in the range 10 to 500 s to the minus 1. The test method is described, and some preliminary results are presented and discussed in order to illustrate the potential and limitations of the technique. (Author)

AD-757 534 PC$3.00/MF$0.95
Oceanics Inc Plainview N Y
WALL INTERFERENCE ON AIRFOILS IN TRANSONIC TUNNELS AT MACH ONE.
Final rept.,
Theodore R. Goodman. May 73, 49p Rept no. 73-95 AFOSR-TR-73-0492
Contract F44620-72-C-0079

Descriptors: (*Airfoils, Test methods), (*Transonic wind tunnels, Flow fields), (*Walls, Interference), Integral equations, Mathematical models, Aerodynamic configurations, Pressure, Statistical analysis, Transonic flow, Approximation (Mathematics).
Identifiers: *Nonlifting airfoils, *Wall interference, Pressure distribution.

A new approximate technique for determining the transonic flow about nonlifting airfoils at Mach 1 is introduced. The technique is based on combining the method of local linearization with an integral method. This combined technique is flexible enough to permit analysis of an airfoil in a transonic wind tunnel in order to determine wind tunnel wall interference effects at Mach 1. The results of carrying out such an analysis indicate that the interference will be negligible whenever a particular condition is satisfied-involving the blockage, the ratio of specific heats, the semi height of the tunnel, and the chord of the airfoil. (Author Modified Abstract)

AD-757 552 PC$3.00/MF$0.95
Wyle Labs Huntsville Ala Eastern Operations
ENVIRONMENTAL IMPACT OF NOISE FROM THE PROPOSED ARNOLD ENGINEERING DEVELOPMENT CENTER (AEDC) HIGH REYNOLDS NUMBER TUNNEL.
Final rept. 13 Mar-30 Jun 72,
K. J. Plotkin, J. E. Robertson, and J. A. Cockburn. Mar 73, 181p Rept no. WR-72-7-Rev AEDC-TR-72-151-Rev
Contract F40600-72-C-0007
Supersedes report dated Oct 72, AD-750 465.

Descriptors: (*Transonic wind tunnels, Noise), (*Noise, Impact), Humans, Animals, Buildings, Tolerances (Physiology), Fracture (Mechanics), Model tests, Reynolds number, Mathematical prediction, Control systems, Warning systems, Acoustic insulation, Monitors, Starting, Operation.
Identifiers: *Noise pollution.

A study to evaluate the environmental impact of the noise produced by a proposed high Reynolds number tunnel (HIRT) under consideration at the Arnold Engineering Development Center (AEDC) has been conducted. The studies include theoretical analyses of the noise generation mechanisms associated with the operation of the facility, and scale-model experiments to provide base-line data for extrapolation to full-scale conditions. This assessment contains all pertinent data of relevance to the noise impact which may be anticipated during HIRT operation and includes a specification of acceptable noise limits for people, animals and buildings which will be exposed to HIRT noise, and special considerations for noise protection and control. (Author Modified Abstract)

AD-757 638 PC$3.00/MF$0.95
Stanford Research Inst Menlo Park Calif
FIELD MAPPING OF CW FACILITY.
Mapping rept.,
Bruce C. Tupper. Jun 72, 199p
Contract DAAK02-69-C-0674

Descriptors: (*Test facilities, Electromagnetic pulses), Electromagnetic fields, Measurement, Polarization, Calibration.
Identifiers: Continuous radiation.

Principal and nonprincipal E- and H-field components were mapped for a continuous wave facility installed at Woodbridge, Virginia. The report contains a description of the facility, sensor calibration techniques used, and the resultant fields generated for the ten frequencies used for mapping. A brief analysis of the field structure is given. (Author)

AD-757 704 PC$3.00/MF$0.95
Naval Civil Engineering Lab Port Hueneme Calif
THE MEASUREMENT OF THE INERTIAL PROPERTIES OF ROUTINELY INSTALLED NAVAL SHORE BASED EQUIPMENT.
Technical note,
D. Pal, and H. A. Gaberson. Jan 73, 74p Rept no. NCEL-TN-1254

Descriptors: (*Naval equipment, Test methods), (*Moment of inertia, Measurement), (*Center of gravity, Measurement), Pumps, Blowers, Electric motors, Thermostats, Test equipment.
Identifiers: *Mass.

The problem of measuring the mass properties of small shore based equipment is discussed. Equipment designed and tested for center of gravity and moment of inertia measurement is described. Typical results of actual measurements are presented. The trifilar pendulum method of moment of inertia measurement is analyzed indetail. A theoretical error analysis is presented and substantiated with experimental results. (Author)

AERE-BIB-181 PC$3.00/MF$0.95
Atomic Energy Research Establishment, Harwell (England).
LIQUID CRYSTALS FOR NONDESTRUCTIVE TESTING.
M. A. Wall. Oct 72, 11p
U. S. Sales only

Descriptors: *Bibliographies, *Materials testing/ nondestructive.

For abstract, see NSA 27 06, number 14341.

AERE-M-2521 PC$3.00/MF$0.95
Atomic Energy Research Establishment, Harwell (England).
METHOD FOR DETERMINING THE DENSITY OF MILLIGRAMME SAMPLES OF FIBRES.
B. E. Chidley. Sep 72, 9p
U. S. Sales only

Descriptors: *Carbon fibers.

For abstract, see NSA 27 06, number 14342.

AERE-R-7155 PC$3.00/MF$0.95
Atomic Energy Research Establishment, Harwell (England).
EXPERIMENTAL CAPACITANCE LIQUID FILM THICKNESS MONITOR. OPERATING INSTRUCTIONS AND CIRCUIT DETAILS.
D. N. Benn. Sep 72, 33p
U. S. Sales only

Descriptors: *Films, *Thickness gages.

For abstract, see NSA 27 06, number 14343.

CEA-CONF-2051 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Saclay (France). Centre D'Etudes Nucleaires.
TECHNOLOGY AND USE OF THERMOCOUPLES OF W-RE ALLOYS.
Robert Schley, and Guy Matteudi. Jun 72, 31p
CONF-720661-1
Lang- In French. From 3. European Conference On Thermophysical Properties Of Solids At High Temperatures- Turin, Italy (20 Jun 1972). U. S. Sales only

Descriptors: *Rhenium alloy couples, *Thermocouples, *Tungsten alloy couples.

For abstract, see NSA 27 06, number 12208.

CEA-R-4282 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique (France). Centre D'Etudes Scientifiques Et Techniques D'Aquitaine.
SHOCK TESTING USING ON ELECTRODYNAMIC SHAKER.
M. Magne, and P. Leguay. Aug 72, 58p
Lang- In French. U. S. Sales only

Descriptors: *Materials testing/ nondestructive.

For abstract, see NSA 27 06, number 14357.

COM-73-50207 PC-GPO/MF$0.95-NTIS
National Bureau of Standards, Washington, D.C. Mechanics Div.
RESEARCH AND TESTING FACILITIES OF THE ENGINEERING MECHANICS SECTION, NATIONAL BUREAU OF STANDARDS, WASHINGTON, D.C.
Special pub. (Final),
Daniel J. Chwirut. Jan 73, 26p NBS-SP-370
Paper copy available from GPO $0.55 as C13.10:370.

Descriptors: (*Test facilities, Mechanics), Test equipment, Force, Dynamic tests, Static tests.
Identifiers: National Bureau of Standards.

The principal characteristics of the force measuring and generating equipment and related research facilities available in the Engineering Mechanics Section of the National Bureau of Standards are described. (Author)

COM-73-50221 PC-GPO/MF$0.95-NTIS
National Bureau of Standards, Washington, D.C. Office of Weights and Measures.
INDEX TO THE REPORTS OF THE NATIONAL CONFERENCE ON WEIGHTS AND MEASURES FROM THE FIRST TO THE FIFTY-SIXTH 1905 TO 1971.
Special pub.,
Frances C. Bell. Feb 73, 47p NBS-SP-377
Supersedes NBS-Misc. Pub-243. Library of Congress Catalog Card no. 73-600013.
Paper copy available from GPO $0.75 as C13.10:377.

Descriptors: (*Weight (Mass), Meetings), (*Measurement, Meetings), Indexes (Documentation).

For ease of reference, the index is presented in two forms, first an index by subject and second an index by name of speaker. A list of the Conference Reports and their availability is given.

COO-2098-1 PC$3.00/MF$0.95
Northern Illinois Univ., Dekalb. Dept. Of Biological Sciences.
USE OF A.E.C. EQUIPMENT.
O. A. Schjeide. 6 Nov 72, 5p
Contract AT (11-1)-2098

Descriptors: *Laboratory equipment.

For abstract, see NSA 27 06, number 14371.

E73-10307 PC$3.50/MF$0.95
Alaska Univ., College. Geophysical Inst.
COORDINATION AND ESTABLISHMENT OF CENTRALIZED FACILITIES AND SERVICES FOR THE UNIVERSITY OF ALASKA ERTS SURVEY OF THE ALASKAN ENVIRONMENT.
Progress rept. Jul 72-Jan 73.
Albert E. Belson, and John M. Miller. 20 Feb 73, 27p NASA-CR130719
Contract NAS5-21833

Descriptors: Imagery, Alaska, Land use, Land management, Earth resources program, Management planning, Multispectral photography.

The author has identified the following significant results. Scene 1072-21173 of the Anaktuvuk Pass region of the Brooks Range, Alaska, was studied from the point of view of a resource survey for purposes of land use planning as part of the effort to develop ERTS data processing and interpretation techniques. Other data sources and surface observations were utilized to produce a resource survey of a remote and undeveloped region of Alaska. Three vegetative types are apparent: moist tundra, low brush, and high brush. Watersheds are easily defined on the multispectral imagery. Features related indirectly to economic minerals are discernible from ERTS-1 imagery supported by ground truth data. These include mountains, outwash plains and alluvial deposits, drainage patterns, lineaments and probable bedding planes. This region falls within present land class categories which are not inconsistent with the imperatives of the resources. These land class categories include native village withdrawals, regional deficiency area, national interest study area for possible inclusion in a national system, public interest areas, utility corridor, and state land selection.

LBL-1 (VOL.1) PC$3.00/MF$0.95
California Univ., Berkeley. Lawrence Berkeley Lab.
INSTRUMENTATION FOR ENVIRONMENTAL MONITORING- AIR.
1 May 72, 283p

Descriptors: *Air, *Instruments, *Sulfur dioxides.

For abstract, see NSA 27 06, number 12215.

PATENT-3708674
Not Available - NTIS
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
COMBUSTION DETECTOR.
Patent
R. L. Trimpi, J. E. Nealy, and W. L. Grose.
Patented 2 Jan 73, 4p NASA-CASE-LAR-10739-1
Filed 16 Apr. 1971 Supersedes N72-21423 (10 - 12, P 1609)
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Mine safety, *Explosions, *Warning systems, *Patents.
Identifiers: PAT.CL.250-217.

A device has been developed for generating a rapid response signal upon the radiation-emitting combustion reaction of certain gases in order to provide a means for the detection and identification of such reaction and concurrently discriminate against spurious signals. This combustion might be the first stage of a coal mine explosion process, and thereby this device could provide a warning of the impending explosion in time to initiate quenching action. This device has the capability of distinguishing between the light emitted from a combustion reaction and the light emitted by miners' lamps, electric lamps, welding sparks or other spurious events so that the quenching mechanism is triggered only when an explosion-initiating combustion occurs.

N73-16486 PC$4.50/MF$0.95
Teledyne Brown Engineering, Huntsville, Ala.
DEVELOPMENT OF TECHNIQUES FOR ADVANCED OPTICAL CONTAMINATION MEASUREMENT WITH INTERNAL REFLECTION SPECTROSCOPY, PHASE 2, VOLUME 2.
Final Report
J. D. Hayes. Dec 72, 48p NASA-CR-128716, SE-NASA-1674-VOL-2
Contract NAS9-12571

Descriptors: *Contaminants, *Space simulators, *Spectral reflectance, Optical measurement, Optical resonance, Spectroscopic analysis, Spectrum analysis.

For abstract, see STAR 11 07.

N73-16487 PC$3.50/MF$0.95
National Aeronautics and Space Administration, Goddard Space Flight Center, GREENBELT, MD.
THE EFFECT OF GRID TRANSPARENCY AND FINITE COLLECTOR SIZE ON DETERMINING ION TEMPERATURE AND DENSITY BY THE RETARDING POTENTIAL ANALYZER.
Jan 73, 27p NC999967
Subm- Submitted for Publication

Descriptors:

For abstract, see STAR 11 07.

N73-16493 PC$11.50/MF$0.95
Xerox Electro-optical Systems, Pasadena, Calif.
REAL-TIME OPTICAL ALIGNMENT AND DIAGNOSTIC SYSTEM (ROADS).
Final Report
17 Nov 72, 189p NASA-CR-128712, EOS-4065
Contract NAS9-11385

Descriptors: *Alignment, *Computer programs, *Real time operation, *Subassemblies, Accumulators, Cathode ray tubes, Collimators, Data acquisition, Flow charts.

For abstract, see STAR 11 07.

N73-16497 PC$5.00/MF$0.95
National Bureau of Standards, Washington, D.C. Instrumentation Applications Section.
DURABILITY INVESTIGATION OF A GROUP OF STRAIN GAGE PRESSURE TRANSDUCERS.
P. S. Lederer, and J. S. Hilten. Dec 72, 59p
NASA-CR-120953, NBSR-10-975
Contract NASA ORDER C-337-C, NBS PROJ. 4253446

Descriptors: *Ambient temperature, *Pressure sensors, *Service life, *Strain gages, Calibrating, Cycles, Dynamic characteristics, Pressure measurements.

For abstract, see STAR 11 07.

N73-16505 PC$7.75/MF$0.95
Institut Franco-allemand de Recherches, St. Louis (France).
MASS SPECTROMETRIC INVESTIGATION OF HYPERSONIC AIR FLOW . MASSENSPEKTROMETRISCHE UNTERSUCHUNG IN HYPERSCHALL-LUFT-STROEMUNGEN.
Ph.D. Thesis - Freiburg Univ., 1971
H. Trinks. 1972, 115p BMVG-FBWT-72-20
Subm- Sponsored By Bundesmin. Fuer Verteidigung

Descriptors: *Air flow, *Hypersonic flow, *Mass spectrometers, *Reentry vehicles, *Shock tubes, Concentration (composition), Flow, Gas dissociation, Gas mixtures, High resolution.

For abstract, see STAR 11 07.

N73-16526 PC$3.50/MF$0.95
Fraunhofer-gesellschaft Zur Forderung Der Angewandten Forschung E. V., Grafschaft (West Germany). Inst. Fuer Aerobiologie.
SEPARATION OF AEROSOL PARTICLES ACCORDING TO SIZE USING A NEW IMPACTOR JET . ZUR ABSCHEIDUNG VON AEROSOLTEILCHEN NACH IHRER GROESSE MITTILS EINER NEUARTIGEN IMPAKTORDUESE.
D. Hochrainer. 1972, 30p BMVG-FBWT-72-11
Subm- Sponsored By Bundesmin. Fuer Verteidigung

Descriptors: *Aerosols, *Impactors, *Size separation, Dust, Flow distribution, Particle size distribution, Particle trajectories, Resolution, Stagnation flow.

For abstract, see STAR 11 07.

N73-16941 PC$7.25/MF$0.95
Denver Research Inst., Colo.
PROGRAM FOR TRANSFER RESEARCH AND IMPACT STUDIES.
Semiannual Report, 1 Jan. - 30 Jun. 1972
Nov 72, 101p DL719035
NASA-CR-130302

Descriptors:

For abstract, see STAR 11 07.

ORO-2504-184 PC$3.00/MF$0.95
Maryland Univ., College Park. Dept. Of Physics And Astronomy.
SHOP DRAWINGS FOR A MEDIUM SIZE MARX GENERATOR. TECHNICAL REPORT NO. 73-009.
W. S. Risk. Aug 72, 31p

Descriptors: *Pulse generators ELECTRONICS.

For abstract, see NSA 27 06, number 14416.

PAT-APPL-230 782 PC$3.00/MF$0.95
Department of Transportation, Washington, D.C.
NON-CONTACTING ANGULAR POSITION DETECTOR.
Patent Application,
Joseph L. Horner, and Gordon R. Plank. 1 Mar 72, 14p DOT/Case-TSC-10023
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: (*Automobiles, *Safety devices), (*Detectors, Rotation), (*Patent applications, Detectors), Sensors, Angles (Geometry), Measuring instruments, Coils, Magneticfields, Attitude (Inclination).
Identifiers: *Angular position detectors.

The angle between a small radio frequency coil and a spacially uniform RF magnetic field is measured and a signal commensurate with the measured angle is employed in a computation of angular position. The apparatus employed in the angle measurement is characterized by a DC frequency response whereby an output signal is produced in the absence of motion between the coil and field. While not limited thereto in its utility, the technique and apparatus of the present invention are particularly well suited for use in the testing of safety devices such as automotive restraint systems. (Author Modified Abstract)

SC-DR-720521 PC$3.00/MF$0.95
Sandia Labs., Albuquerque, N. Mex.
PERFORMANCE AND OPERATION OF THE HIGH-PRESSURE ARC HEATER OF THE SANDIA 2-MEGAWATT PLASMAJET FACILITY.
K. L. Goin. Dec 72, 41p

Descriptors: *Wind tunnels.

For abstract, see NSA 27 06, number 14426.

SC-DR-720709 PC$3.00/MF$0.95
Sandia Labs., Albuquerque, N. Mex.
PERFORMANCE CALIBRATION OF THE SANDIA ARC-DRIVEN SHOCK TUBE.
J. L. Mark. Dec 72, 62p

Descriptors: *Shock tubes.

For abstract, see NSA 27 06, number 14428.

Y-DA-4839 PC$3.00/MF$0.95
Oak Ridge Y-12 Plant, Tenn. (Usa).
AIR-BEARING LVDT TRANSDUCER.
W. H. Rasnick. Dec 72, 5p CONF-721130-23
Contract W-7405-ENG-26
From Precision Machining And Gaging Conference, Oak Ridge, Tn (14 Nov 1972).

Descriptors: *Gages and meters, *Transducers.

For abstract, see NSA 27 06, number 14457.

Y-DJ-10783 PC$3.00/MF$0.95
Oak Ridge Y-12 Plant, Tenn. (Usa).
GAGE CALIBRATION AND CONTROL SYSTEM.
R. L. Davis. Dec 72, 8p CONF-721130-12
Contract W-7405-ENG-26
From Precision Machining And Gaging Conference, Oak Ridge, Tn (14 Nov 1972).

Descriptors: *Gages and meters.

For abstract, see NSA 27 06, number 14460.

Y-DL-225 PC$3.00/MF$0.95
Oak Ridge Y-12 Plant, Tenn. (Usa).
SURVEY OF NONDESTRUCTIVE TESTING AS APPLIED TO DIMENSIONAL MEASUREMENT.
J. W. Garber. Dec 72, 16p CONF-721130-15
Contract W-7405-ENG-26
From Precision Machining And Gaging Conference, Oak Ridge, Tn (14 Nov 1972).

Descriptors: *Materials testing/ nondestructive.

For abstract, see NSA 27 06, number 14461.

Y-DN-17 PC$3.00/MF$0.95
Oak Ridge Y-12 Plant, Tenn. (Usa).
CALIBRATION OF DISPLACEMENT TRANSDUCERS.
T. R. Butler. Dec 72, 10p CONF-721130-8
Contract W-7405-ENG-26
From Precision Machining And Gaging Conference, Oak Ridge, Tn (14 Nov 1972).

Descriptors: *Transducers.

For abstract, see NSA 27 06, number 14463.

Y-1860 PC$3.00/MF$0.95
Oak Ridge Y-12 Plant, Tenn. (Usa).
AUTOMATED TEXTURE DIFFRACTOMETER.
T. L. Williams. 13 Dec 72, 31p
Contract W-7405-ENG-26

Descriptors: *Diffractometers.

For abstract, see NSA 27 06, number 14453.

14C. Recording Devices

COM-73-50206 PC-GPO/MF$0.95-NTIS
National Bureau of Standards, Washington, D.C. Mechanics Div.
MAGNETIC RECORDING OF ACOUSTIC DATA ON AUDIOFREQUENCY TAPE.
Technical note (Final),
Edwin D. Burnett, Edith L. R. Corliss, and Raymond D. Berendt. Apr 72, 29p NBS-TN-718
Previously announced as N72-20169.
Paper copy available from GPO $0.40 as C13.46:718.

Descriptors: (*Magnetic recording, Audio frequencies), Acoustic measurement, Calibrating, Signal to noise ratio.

The report discusses the application of magnetic tape recording to storage and analysis of data obtained in the course of acoustic measurements. In general, the most suitable machines are those designed primarily for recording studios. Advantages in signal-to-noise ratios and extended linear range can be realized by careful choice of recording medium, adjustment of the equipment to optimum performance, and proper care in monitoring the recording process. General instructions for realizing these advantages are given. Particular emphasis is given to the procedures for making well-calibrated recordings in the field, for analysis of noise problems. (Author)

PAT-APPL-324029 PC$3.00/MF$0.95
TECHNIQUE FOR RECOVERY OF VOICE DATA FROM HEAT DAMAGED MAGNETIC TAPE.
Patent Application
J. F. Melugin, and D. E. Obrien, III. Filed 16 Jan 73, 12p NASA-CASE-MSC-14219-1
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Data retrieval, *Magnetic tapes, *Temperature effects, *Voice data processing, Damage, Patent applications.

A method is presented for conditioning, and thus enabling retrieval of intelligence from magnetic tape after damage from heat has caused the tape to wrinkle, curl severely, and be reduced to less than one-half its original size. The damaged tape is superposed on a first piece of splicing tape with the oxide side of the magnetic tape in contact with the adhesive side of the splicing tape and then carefully smoothed by a special tool. A second piece of splicing tape is placed on the backing side of the magnetic tape then the resulting tape stack is trimmed to the original width of the magnetic tape. After the first piece of splicing tape is carefully removed from the oxide side of the damaged magnetic tape, the resulting magnetic tape is then ready to be placed into a recorder for playback.

14D. Reliability

AD-757 168 PC$3.00/MF$0.95
Army Materiel Systems Analysis Agency Aberdeen Proving Ground Md
MAXIMUM LIKELIHOOD ESTIMATION FROM RENEWAL TESTING.
Technical rept.,
Larry H. Crow. Apr 72, 64p Rept no. AMSAA-TR-57

Descriptors: (*Reliability, *Statistical analysis), Life expectancy, Probability density functions, Random variables, Asymptotic series, Matrix algebra, Theorems.
Identifiers: *Maximum likelihood estimation, Weibull density functions, Nonparametric statistics, Failure rate functions, Asymptotic normality, Renewal theory, Life tests.

The report considers the maximum likelihood estimates of life-time distributions over an interval (O,T) from the following time truncated experiment. At time zero, the beginning of the testing n (1 <or= n < infinity) items are put on test. When an item fails it is replaced and at time T all testing is stopped. Assumptions about the form of the life-time distribution on (O,T) are required. Distributions considered are: A single parameter class which includes the Weibull family; A multiple parameter class with increasing failure rate on (O,T); and A nonparametric class which includes the increasing failure rate family. Useful and desirable properties of the maximum likelihood estimates are shown. (Author)

AD-757 608 PC$3.00/MF$0.95
Army Missile Command Redstone Arsenal Ala Systems Engineering Directorate
RELIABILITY ANALYSIS OF UNPACED VISUAL INSPECTION TASKS.
Technical rept.,
Robert G. Wilson. 15 Mar 73, 96p Rept no. RC-73-1

Descriptors: (*Reliability, *Statistical analysis), (*Quality control, Performance (Human)), (*Visual inspection, Performance (Human)), Probability density functions, Statistical tests, Errors, Acceptability, Computer programs.
Identifiers: Gamma density functions, Lognormal density functions, Normal density functions, Weibull density functions, Exponential density functions.

The research was directed toward application of classical hardware reliability analysis methods to describe human performance error rates on discrete tasks. The specific problem investigated was the mathematical formulation needed to describe the probability of human error associated with discrete unpaced, visual inspection tasks. Knowledge of the inspector's perception of the percentage defective, his ability to numerically express his perception, and the effect of a dynamic environment on each were several secondary objectives which impacted this research and which needed to be investigated. Ten subjects were laboratory tested, with the number of items to first error, items between errors, defects to first error, and defects between errors recorded. Through classical inference theory, the underlying distributions of errors were investigated. (Author Modified Abstract)

N73-16517 PC$3.50/MF$0.95
Forsvarets Teletekniska Lab., Stockholm (Sweden).
INVESTIGATIONS INTO RELIABILITY DIRECTED ON MATERIAL TECHNICAL METHODS . TILLFOERLITLIGHETSFORSKNING MED INRIKTNING PA MATERIALTEKNISKA METODER.
O. Bjoerklund, and H. Broberg. Feb 71, 28p
FTL-A-A16-1
Language Swedish

Descriptors: *Electronic equipment, *Failure analysis, *Performance prediction, *Reliability engineering, Analysis of variance, Performance tests, Prediction analysis techniques, Quality control.

For abstract, see STAR 11 07.

14E. Reprography

AD-757 144 PC$3.00/MF$0.95
Army Electronics Command Fort Monmouth N J
A SIMPLIFIED PRINTING SYSTEM FOR COLOR NEGATIVES.
Research and development technical rept.,
Marilyn Levy, and Richard G. LeSchander. Feb 73, 20p* Rept no. ECOM-4082

Descriptors: (*Color photography, Printing), Photographic techniques, Photographic filters.

A system is described that will enable an operator of minimum skills to predict the proper color filtration required to print any color negative. This method differs from those currently used in that the unexposed processed portion of the negative, rather than the image portion of the negative, is used for the determination. One trial print is made of the blank, negative leader or trailer through either a filter matrix or a step tablet to determine the correct filter combination that will produce a grey image. The use of this method in both additive and subtractive color printing is discussed. (Author)

AD-757 146 PC$3.00/MF$0.95
Army Electronics Command Fort Monmouth N J
A RAPID COLOR NEGATIVE PROCESSING SYSTEM.
Technical rept.,
Marilyn Levy, and Harmon A. Willey. Mar 73, 21p* Rept no. ECOM-4089

Descriptors: (*Color film, Processing), Time, Effectiveness, Temperature.
Identifiers: *Photographic developers.

An 11 1/2 minute processing system for color negative films is described that consists of the following four sequential steps: development, bleach-fix, wash, and photo-flo rinse at 75F. Formulations are given for a 5 1/2 minute color developer and a 3 minute bleach-fix. Eastman Kodak Ektacolor Type S and Kodocolor Type X films processed in this chemistry have sensitometric characteristics equivalent to those obtained after processing the films for 53 minutes in Eastman Kodak C-22. The paper discusses the capacity and shelf-life of these solutions and the stability of the processed films to ultraviolet exposure, high temperature, and high humidity storage. (Author)

N73-16485 PC$5.50/MF$0.95
Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
STUDY OF THE DETAIL CONTENT OF APOLLO ORBITAL PHOTOGRAPHY.
Final Report
R. E. Kinzly. 29 Sep 72, 70p NASA-CR-130378, CAL-VT-2912-O-1
Contract NSR-33-009-087

Descriptors: *Apollo flights, *Command modules, *Imaging techniques, *Lunar photography, Lunar orbits, Lunar topography, Motion.

For abstract, see STAR 11 07.

N73-16504 PC$3.50/MF$0.95
Royal Aircraft Establishment, Farnborough (England).
COLOUR OR MONOCHROME FILMS IN LABORATORY EXPERIMENTS ON THE ACQUISITION OF GROUND TARGETS FROM MEDIUM ALTITUDE.
W. F. Fielding. May 72, 28p RAE-TR-72064, BR-29305

Descriptors: *Aerial photography, *Color photography, *Photographic film, *Target acquisition, Rangefinding, Simulation, Terrain analysis.

For abstract, see STAR 11 07.

15. MILITARY SCIENCES

15A. Antisubmarine Warfare

AD-757 029 PC$3.00/MF$0.95
Center for Naval Analyses Arlington Va Operations Evaluation Group
ANTISUBMARINE ATTACK: COMPUTER PROGRAM 13-64P,
S. A. Denenberg, and A. Hershaft. 28 Aug 64, 45p
Rept no. OEG-Research Contrib-60
Contract Nonr-3732 (00)

Descriptors: (*Antisubmarine warfare, *Computer programs), Mathematical models, Kill probabilities, Miss distance, Monte Carlo method, Graphics.
Identifiers: IBM 7090 computers, FORTRAN, Computerized simulation.

An IBM 7090 computer program is described which calculates the distribution of distances between the point of activation of a weapon and a moving target submarine taking into account the estimated component attack errors. The model used is more flexible and realistic than similar past errors and is expected to produce more reliable submarine kill probabilities. The miss distances are computed by Monte Carlo simulation of the actual tracking and firing tactics. They are plotted by an SC 4020 plotter, first in ascending order, then as a cumulative frequency distribution. Flow charts, a listing of the FORTRAN program, and a sample calculation are included. (Author)

15B. Chemical, Biological, and Radiological Warfare

AD-757 636 PC$3.00/MF$0.95
Ballistic Research Labs Aberdeen Proving Ground Md
GRADIENT AND LESS LETHAL DEVICES IN CONTROL OF URBAN VIOLENCE,
R. H. Stolfi. Mar 73, 190p Rept no. BRL-1635

Descriptors: (*Insurgency, *Urban areas), (*Nonlethal agents, Insurgency), (*Personnel, *Training), Officer personnel, Military facilities, Civilian personnel, Deterrence, Helicopters, Light pulses, Tear gas, Small arms, Shotguns, Foams, Vehicles, Projectiles.
Identifiers: *Riot control, *Public demonstrations, Shock batons, Stun guns, Jet foam guns.

Worldwide authorities, charged with maintaining the peace in their communities, are united in the belief that riots and demonstrations must be handled with the minimum force necessary. To respond in this fashion requires spearate contingents of civil and military forces, specially selected and vigorously trained in the operations, tactics, techniques and devices most effective in executing the minimum force theory. The report describes various forms of an approach for dealing with urban violence, drawing upon the experiences and doctrine of civil and military authorities around the world. Weapons and devices to support the tactical units of riot control forces are a major consideration. (Author Modified Abstract)

15C. Defense

AD-757 153 PC$3.00/MF$0.95
Ballistic Research Labs Aberdeen Proving Ground Md
ACCURACY OF HEMP CODE SOLUTIONS.
Memorandum rept.,
Robert R. Karpp. Jan 73, 42p Rept no. BRL-MR-2268

Descriptors: (*Warheads, Design), (*Programming (Computers), Warheads), Initial value problems, Numerical analysis, Explosive materials, Elasticity, Boundary value problems, Design, Mathematical models.
Identifiers: HEMP computer program, Finite difference theory, Computer aided design.

Results of HEMP code calculations of simple problems are compared with exact results to determine the accuracy with which this numerical technique solves initial-boundary value problems. More complicated problems of metal liners accelerated by explosives were also calculated with this code, and these results were compared with experimental results to determine how well the code simulates these physical processes. It is concluded that HEMP calculations are accurate enough to be useful as a tool for predicting the gross motion of metals accelerated by detonating explosives. (Author)

AD-757 568 PC$11.75/MF$0.95
Army Foreign Science and Technology Center Charlottesville Va
ANTI-AIRCRAFT DEFENSE HERALD. NUMBER 9, 1972.
21 Feb 73, 195p Rept no. FSTC-HT-23-1273-73
Trans. of Vestnik Proitivovozdushnoi (USSR) n9 Sep 72. The above journal is translated on a regular basis.

Descriptors: (*Antiaircraft defense systems, *USSR), Political science, Combat readiness, Radar, Military training, Electronic equipment, Radio equipment, Navigational aids.
Identifiers: Translation.

Contents: Military training; Radio electronic weaponry; Combat readiness; Air navigation; Military intelligence and some aspects of logistics.

AD-757 640 PC$3.00/MF$0.95
Iowa State Univ Ames Dept of Sociology and Anthropology
LOCAL CIVIL DEFENSE DIRECTORS IN ACTION: DISASTER PRIORITIES FOR THE 70'S AND INVOLVEMENT IN DCPA PROGRAMS.
Final rept.,
Charles L. Mulford, Gerald E. Klonglan, Dan L. Tweed, and Joseph P. Kopachevsky. Sep 72, 74p
Rept no. Sociology-101B
Contract DAHC20-71-C-0272
See also report dated Mar 72, AD-744 478, AD-757 641 and AD-757 642.

Descriptors: (*Civil defense systems, *Management planning), Statistical data, Training, Shelters, Attitudes, Sociology.

The report is the first of a five-part series which presents the initial questions and responses of items related to Disaster Priorities and Involvement in Defense Civil Preparedness Agency Programs obtained from a national sample of local civil defense director/coordinators. The report presents through the use of simple descriptive statistics (frequency, mean, mode, std. dev., etc.) content areas which include: areas of local emphasis (nuclear, natural, etc.), opinions concerning future involvement in DCPA programs (CDUEP, CSP, RCD, etc.), present involvement in DCPA programs, usefulness of DCPA programs, home shelter sharing, and attitudes and perceptions of local directors concerning home shelter sharing. Secondly, the report also contains the questions, item format, codes utilized in the initial data analysis, and a glossary of statistical terms used in the report. (Author Modified Abstract)

AD-757 641 PC$3.00/MF$0.95
Iowa State Univ Ames Dept of Sociology and Anthropology

LOCAL CIVIL DEFENSE DIRECTORS IN ACTION: PREPAREDNESS FOR DISASTERS.
Final rept.,
Gerald E. Klonglan, Charles L. Mulford, Dan L. Tweed, Joseph P. Kopachevsky, and Sue Faisal.
Oct 72, 108p Rept no. Sociology-101C
Contract DAHC20-71-C-0272
See also report dated Mar 72, AD-744 478, AD-757 640 and AD-757 642.

Descriptors: (*Civil defense systems, *Management planning), Statistical data, Shelters, Organizations, Training, Attitudes, Sociology.

The report is the second of a five-part series which presents the initial questions and responses of a national sample of local civil defense director/coordinators to items related to local preparations for disasters. The report presents with the use of simple descriptive statistics (frequency, mean, mode, std. dev., etc.) content areas which include the preparation, results and perceived usefulness of Local Contingency Planning, Emergency Operating Centers and Emergency Operations Simulations. A second part of the report presents responses to a series of questions concerning the uses of the local program paper and its perceived adequacies or inadequacies. (Author Modified Abstract)

AD-757 642 PC$3.00/MF$0.95
Iowa State Univ Ames Dept of Sociology and Anthropology
LOCAL CIVIL DEFENSE DIRECTORS IN ACTION: PERCEIVED PROBLEMS AND PATTERNS OF INTERACTION.
Final rept.,
Charles L. Mulford, Gerald E. Klonglan, Dan L. Tweed, Joseph P. Kopachevsky, and Sue Faisal.
Oct 72, 81p Rept no. Sociology-101D
Contract DAHC20-71-C-0272
See also report dated Mar 72, AD-744 478, AD-757 640 and AD-757 641.

Descriptors: (*Civil defense systems, Management planning), Questionnaires, Statistical data, Personnel, Communication systems, Public opinion, Attitudes, Sociology.

The report is the third of a five-part series of reports which presents the initial questions and responses to items related to the problems, communication and interaction of local civil defense director/coordinators obtained from a national sample of that group. The report presents with the use of simple descriptive statistics (frequency, mean, mode, std. dev., etc.) content areas which include: problems with resources, relations with local government, relations with the public, etc. The second part of the report focuses on the communications with local government and State C.D. officials and the interaction of directors with other civil defense personnel. (Author)

AD-757 719 PC$3.00/MF$0.95
Research Triangle Inst Durham N C Operations Analysis Dept
A MODEL OF THE LOCAL CIVIL DEFENSE OPERATING SYSTEM.
Final rept. Dec 70-Oct 72,
Robert N. Hendry, and Dora B. Wilkerson. Mar 73, 52p Rept no. RTI-43U-614
Contract DAHC20-71-C-0222

Descriptors: (*Nuclear explosion damage, Countermeasures), (*Urban areas, Nuclear warfare), Civil defense systems, Mathematical models, Programming (Computers), Transportation, Operation, Effectiveness.

A countermeasures model which is part of the analytical structure (TELOS) to evaluate solution alternatives to damage problems was developed. The objective is to provide a means for placing relative values on alternative countermeasure concepts. Such an evaluation will provide better information to support recommendations for civil defense programs. This model describes the prototype design of the time-phased Local Countermeasures Model. Major accomplishments were the programming of three submodels. Work to date has enabled demonstration of many of the elements, procedures, and assignment criteria used in describing local civil defense operating systems. (Author Modified Abstract)

15D. Intelligence

AD-757 218 PC$3.00/MF$0.95
Auerbach Corp Philadelphia Pa
NEEDS ANALYSIS FOR INFERENCE SYSTEMS AT FTD.
Interim technical rept. 22 Mar-24 Oct 72,
Jerome D. Sable, and Stanley Forst. Jan 73, 54p Rept no. AUER-2022-TR-1 RADC-TR-73-4
Contract F30602-72-C-0273

Descriptors: (*Military intelligence, *Data processing systems), Communications intelligence, Military facilities, Armed forces (Foreign), Armed forces supplies, Decision making, Programming (Computers), Computer logic.
Identifiers: Deductive inference procedures.

The report documents the first phase of the BIAS Augmentation Study, an investigation into the requirements for, and approaches to, the incorporation of deductive inference procedures into the Basic-Level Intelligence Analysis System (BIAS) at the Foreign Technology Division. The first, or Needs Analysis phase, identifies inference procedures appropriate to FTD Scientific and Technical (S+T) Intelligence problems which can be mechanized within the current relational data system technology, identifies the data structures and data base management capabilities which are appropriate to support the development of the identified procedure and evaluates the available software resources at FTD with respect to whether or not it provides an ample base for the development of the required inference procedures. (Author)

15E. Logistics

AD-757 016 PC$3.00/MF$0.95
Naval Ship Research and Development Center Annapolis Md
COMPUTER SIMULATION OF SHIP UNDERWAY REPLENISHMENT, FEASIBILITY STUDY,
Samuel H. Brown, and Lanny J. Puckett. Mar 73, 39p Rept no. NSRDC-27-267

Descriptors: (*Naval vessels (Combatant), Logistics), Maneuverability, Steering, Control systems, Equations of motion, Mathematical models.
Identifiers: *Replenishment at sea, Computerized simulation, Stationkeeping.

The report concludes that a computer simulation of ship underway replenishment can be developed. A system of linear equations of motion for describing two ships maneuvering on essentially parallel courses is chosen as the basic equations for the mathematical model to be used in the computer simulation. The derivation of these linear equations is presented. A better representation using nonlinear equations of motion will be considered in a later phase of the study. (Author)

AD-757 027 PC$3.00/MF$0.95
Center for Naval Analyses Arlington Va Operations Evaluation Group
CARRIER-BASED AIRCRAFT AND REPAIR CAPACITY TRADE-OFFS: AN EMPIRICAL APPROXIMATION,
J. N. Fry. 18 Mar 64, 26p Rept no. OEG-Research Contrib-52

Descriptors: (*Naval aircraft, Maintenance), (*Aircraft carriers, Attack bombers), Logistics, Mathematical models, Regression analysis, Maintenance personnel, Mission profiles.
Identifiers: Tradeoffs, Sorties, *Logistics management, A-4 aircraft, A-4B aircraft.

A crude model of the sortie capacity of a carrier-based attack squadron as a function of the number of aircraft and the number of maintenance personnel is developed. Fleet data for A4B squadrons is used to derive values for the model constants by multiple regression techniques. Variation of model parameters is employed to derive an approximation of a trade-off curve for numbers of aircraft and quantity of 'repair capacity' for a carrier-based A4B squadron. Some additional trade-offs implicit in the model are exhibited. (Author)

AD-757 045 PC$3.00/MF$0.95
Center for Naval Analyses Arlington Va Naval Warfare Analysis Group
A NOTE ON DISCOUNTING IN SYSTEMS ANALYSIS.
Project strike document,
H. Demsetz. 31 Oct 63, 7p Rept no. NWAG-Research Contrib-22

Descriptors: (*Logistics, *Economics), Costs, Cost effectiveness, Armed forces budgets, Systems engineering.
Identifiers: Strike project, *Cost discounting, Systems analysis.

The rationale for discounting in system analysis is discussed briefly and an important field of sub-optimization is pointed out where discounting procedures are inconsequential. (Author)

AD-757 057 PC$3.00/MF$0.95
Control Analysis Corp Palo Alto Calif
THE IMPACTS OF CONSOLIDATION OF REPAIR FACILITIES.
Technical rept.,
Donald L. Iglehart, and Richard C. Morey. Feb 73, 23p Rept no. TR-266-7
Contract N00014-72-C-0266

Descriptors: (*Logistics, Management planning), (*Naval equipment, Maintenance), Costs, Malfunctions, Inventory analysis, Distribution functions, Random variables, Stochastic processes, Mathematical models, Reliability.
Identifiers: *Repair facilities consolidation, *Logistics management.

The paper develops and illustrates an approach for analytically assessing the impacts on both costs and service of consolidation of repair facilities. The repair facilities are two echelon generalizations of the classical repairmen problem in which two types of failures occur, requiring repair at different echelons. The types of questions raised include the reduction in space possible under the consolidated configuration and yet still provide the same level of service, and the physical separation between the users and the consolidated repair facility that is economical. The method of analysis is based upon asymptotic approximation developed for the repairmen problem, valid when the number of operational equipments is large (greater than 50). Three traffic intensity situations are investigated, depending upon the relationships of the number of spares, number of service channels, failure rates and repair rates. (Author)

AD-757 169 PC$3.00/MF$0.95
Army Construction Engineering Research Lab Champaign Ill
OPTIMIZATION OF RESOURCE ALLOCATION IN MAINTENANCE MANAGEMENT LOGISTICS SYSTEMS.
Technical manuscript,
R. L. Trent, E. Martin, and J. C. Wine. Feb 73, 23p Rept no. CERL-TM-A-9

Descriptors: (*Logistics, Optimization), (*Antimissile defense systems, Logistics), Management planning, Manpower, Scheduling, Systems engineering, Maintenance.
Identifiers: Resource allocation, *Logistics management, *Maintenance management, Safeguard antiballistic missile systems.

System availability and cost constraints imposed on tactical weapon systems necessitate corresponding care in the design and implementation of their associated maintenance management systems. It is necessary to forecast maintenance manpower staffing levels required to ensure consistent system performance within operational goals, and to perform comparative analyses of total program costs, including supportive resources. Examples of the constraints and types of rules imposed on a resource allocation system designed for application to the SAFEGUARD Ballistic Missile Defense System is described. Based upon these rules, a computerized management system is designed which meets maintenance planning and operational requirements. (Author Modified Abstract)

AD-757 359 PC$3.00/MF$0.95
Logistics Management Inst Washington D C
DOD MATERIEL DISTRIBUTION SYSTEM: SCOPE AND STUDY PLAN. VOLUME I.
Final rept.
Feb 73, 61p Rept no. LMI-72-13-Vol-1
Contract SD-271
See also Volume 2, AD-757 360.

Descriptors: (*Department of Defense, *Material control), (*Linear programming, Logistics), Management planning, Inventory control, Warehouses, Supply depots, Transportation, Mathematical models.
Identifiers: *Logistics management, *Systems analysis.

The report presents a study plan leading to improved capability to manage the extremely complex DoD Materiel Distribution System. The system contains many elements and echelons and a myriad of interactions. It was determined that no presently developed analytic technique is able to surface those interactions and perform total system analysis. Therefore, two promising modeling techniques, requiring additional development effort, are recommended for development: An aggregated simulation model of the system, including the decision makers, for analysis of system dynamics, and a linear programming model, reflecting organization interaction and priority conflicts among elements and echelons, to calculate static optima. (Author Modified Abstract)

AD-757 360 PC$3.00/MF$0.95
Logistics Management Inst Washington D C
DOD MATERIEL DISTRIBUTION SYSTEM: SCOPE AND STUDY PLAN. VOLUME II.
Final rept.
Feb 73, 129p Rept no. LMI-72-13-Vol-2
Contract SD-271
See also Volume 1, AD-757 359.

Descriptors: (*Department of Defense, *Material control), Management planning, Inventory control, Decision making, Warehouses, Supply depots, Transportation, Mathematical models, Optimization, Linear programming.
Identifiers: *Logistics management, *Systems analysis, Computerized simulation, Resource allocation.

The report contains the following appendices to the basic report (AD-757 359): Discussion of selected references; Study plan; Simulation; The generalized goal decomposition model.

AD-757 670 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
AN INVESTIGATION OF THE INDEPENDENCE BETWEEN SUPPLY ECHELONS FOR THE SHIPS SUPPLY SUPPORT STUDY.
Master's thesis,
Gene Elwin Brennan, and Gary Lewis Starkey.
Mar 73, 74p

Descriptors: (*Naval equipment, *Inventory analysis), Naval procurement, Stock level control, Armed forces supplies, Random variables, Statistical tests, Mathematical models, Computer programs, Maintainability, Theses.
Identifiers: Computerized simulation, *Logistics management.

The ships supply support study developed a fleet supply support simulator in which supply support dollar outlays may be related to fleet capability. A critical assumption made in the development of the simulator states that the availability of an item at a given echelon is independent of its availability at other echelons. A computer model of a single item multi-echelon supply support system is constructed. A day by day history of the status of each entity in the system is obtained along with an in and out of stock profile for the item by calendar time at each echelon. Marginal availabilities and conditional availabilities are compared, and other measures of the degree of dependence of echelon availabilities are presented. Finally, the computer model is extended to consider a multi-item supply system and similar tests are made. (Author)

AD-757 696 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
A STOCHASTIC MODEL OF A REPAIRABLE ITEM INVENTORY SYSTEM.
Technical rept.,
F. Russell Richards. Dec 72, 36p Rept no. NPS-55RH72121A

Descriptors: (*Naval equipment, *Inventory control), Stock level control, Naval procurement, Maintenance, Inventory analysis, Spare parts, Random variables, Mathematical models.
Identifiers: *Logistics management.

An inventory system for repairable items is studied. A stochastic model which cooridnates procurement and repair decisions is developed. Special attention is paid to modeling the repairable item system so that the results derived in this report are applicable for Navy inventory management. Long-run distributions forboth the ready-for-issue and the non-ready-for-issue stock and many useful measures of performance are determined. Uses of the information to analyze the critical factors in a repairable item system and to determine optimal values of the paramerers are pointed out. Numerical examples of the calculations of the measures of effectiveness are presented. Finally, modifications of the model to include the zero attrition case and consumable items are pointed out. (Author)

15F. Nuclear Warfare

AD-757 032 PC$3.00/MF$0.95
Center for Naval Analyses Arlington Va Operations Evaluation Group
THE CONTROVERSY OVER COUNTERFORCE.
Interim research memo.,
J. B. Kadane. 12 Aug 63, 20p Rept no. OEG-IRM-44

Descriptors: (*Nuclear warfare, *Deterrence), Cold war, Tactical warfare, United States Government, Foreign policy, Operational readiness, Defense systems, Threat evaluation, Decision making.
Identifiers: *Counterforce, *Minimum deterrence, First strike capability, Massive retaliation.

The report compares the arguments of an important proponent of counterforce, Herman Kahn, and one of its leading critics, Michael Brower. After examining the various arguments the conclusion is reached that neither total counterforce nor no counterforce is the best policy, but rather some intermediate quantity of counterforce. Therefore it attacks the 'counterforce' vs. 'minimum deterrence' dichotomy. (Author)

15G. Operations, Strategy, and Tactics

AD-757 033 PC$3.00/MF$0.95
Center for Naval Analyses Arlington Va Operations Evaluation Group
CATALOG OF NAVAL CAPABILITIES PERTINENT TO COLD WAR AND LIMITED WAR.
Interim research memo.,
R. S. Titchen. 15 Nov 61, 6p Rept no. OEG-IRM-3

Descriptors: (*Naval operations, *Operational readiness), (*Limited war, Naval operations), Combat readiness, Mobility, Naval vessels (Combatant), Naval vessels (Support), Deployment, Logistics, Close support.

The report lists the general capabilities of the U.S. Navy to perform missions in cold war and certain kinds of limited war. This listing has been prepared because of the recent interest in national ability to provide graduated responses short of nuclear war. (Author)

AD-757 046 PC$3.00/MF$0.95
Center for Naval Analyses Arlington Va Naval Warfare Analysis Group
THE PROBABILITY DISTRIBUTION OF THE NUMBER OF TARGETS HIT UNDER SUCCESSIVE FIRINGS.
Project strike document,
R. Isaacs. 31 Oct 63, 14p Rept no. NWAG-Research Contrib-23

Descriptors: (*Precision bombing, *Kill probabilities), Random variables, Set theory, Theorems, Mathematical models.
Identifiers: Strike project.

A mathematical development is presented which answers two questions concerning the probablistic outcomes of a succession of weapons (bombs) aimed at some complex of targets. Given a set of k targets and the probabilities that each is hit by a single bomb, as well as the probability of a miss, what are the probabilities of destroying 0, 1, 2, ..., k targets when n bombs attack. A target is supposed destroyed when hit by at least one bomb, and the same, but there is now a positive probability that a pair of targets may be destroyed by a single bomb. (Author)

AD-757 236 PC$10.25/MF$0.95
Army Foreign Science and Technology Center Charlottesville Va
APPLICATION OF MATHEMATICAL METHODS IN MILITARY AFFAIRS. CHAPTERS II, IV, AND V,
I. Anureev, and A. Tatarchenko. 5 Jan 73, 162p Rept no. FSTC-HT-23-844-71
Trans. from Primenenie Mathematicheskikh Metodov v Voennom Delle, Moscow, 1967 Chaps. 2,4, and 5.

Descriptors: (*Armed Forces operations, Mathematical models), War games, Aerial warfare, Tactical warfare, Kill probabilities, Interception probabilities, Miss distance, Game theory, Mathematical programming, Queueing theory, Antisubmarine warfare, Antimissile defense systems, Food dispensing, Stochastic processes, USSR.
Identifiers: Translations, Applications of mathematics.

Some fundamentals of probability theory are presented in the report. Then, through examples, it is shown how these fundamentals can be used in

choosing the means (weapons, units, etc.) for solving certain military problems. Staging aerial attacks and setting up defenses against them is discussed. Problems of deploying different forces (especially aerial) against different enemy targets, using principles of probability so as to obtain the most effective deployment are solved. Various conditions and complications are added in the continuing examples. Various methods of solving problems which contain many unknown factors (mathematical programming) and linear problems are outlined. Examples are given, concerning, e.g., minimizing transport costs and assigning weapons to targets. Several distribution problems of a military nature are presented. A step-by-step solution for each problem using methods of linear programming, is given. (Author Modified Abstract)

AD-757 289 PC$5.50/MF$0.95
Naval Intelligence Support Center Washington D C Translation Div
SOVIET NAVAL DIGEST. NUMBER 8, 1972. SELECTED TRANSLATIONS.
6 Feb 73, 66p Rept no. NISC-Trans-3396
Trans. from Morskoi Sbornik (USSR) n8 p14-29, 32-40, 81-85, 89-99, 103-104, 107 1972.

Descriptors: (*Naval operations, USSR), Naval vessels (Combatant), Naval vessels (Support), Naval personnel, Communists, Sonar beacons, Ship noise, Antisubmarine aircraft.
Identifiers: Translations.

The report contains selected articles relative to naval activities of vessels and personnel in the Soviet Union.

AD-757 453 PC$3.00/MF$0.95
Saclant ASW Research Centre La Spezia (Italy)
EXTENSIONS OF A TIME-DEPENDENT STOCHASTIC MODEL FOR A COMBAT BETWEEN SUBMARINES AND DEFENDED CONVOYS,
Kare M. Mjelde. 1 Jan 73, 58p Rept no. SACLANTCEN-SM-1

Descriptors: (*Undersea warfare, Naval vessels (Support)), (*Naval vessels (Combatant), Undersea warfare), Merchant vessels, Kill probabilities, Torpedoes, Guided missiles (Underwater-to-surface), Mathematical models, Stochastic processes, Random variables, Partial differential equations, Italy.
Identifiers: Convoys.

A time-dependent stochastic model for the losses of convoyed ships due to submarine attacks has been extended in three different ways to cover the following cases: A non-zero time to complete an attack on a convoy; Different kinds of weapons; and Different types of targets. Several tactical options are included in each extension. (Author)

AD-757 457 PC$3.00/MF$0.95
Saclant ASW Research Centre La Spezia (Italy)
DEFENCE OF SHIPPING: A COMPUTER PROGRAM FOR NUMERICAL SOLUTION OF A NONLINEAR LANCHESTER COMBAT MODEL,
Tore Kristiansen. 15 Feb 73, 42p Rept no. SACLANTCEN-SM-5

Descriptors: (*Shipping (Marine), Threat evaluation), (*Lanchester equations, *Computer programs), War games, Mathematical models, Nonlinear differential equations, Kill probabilities, Undersea warfare, Antisubmarine warfare, Numerical analysis, Integration, Italy.
Identifiers: ALGOL, Numerical integration.

The paper describes a computer program developed to set up and integrate a system of Lanchester differential equations describing the progress of an anti-shipping campaign. The equations are strongly nonlinear and the coefficients are complicated functions of the dependent variables. Since no analytic solution seems possible, a Runge-Kutta-Merson method has been used to obtain a numerical solution for specified times. Two different versions of the program exist, each describing a campaign model based on slightly different assumptions. Examples are given showing complete sets of input data and the resulting output. (Author)

AD-757 557 PC$3.00/MF$0.95
Tactical Air Reconnaissance Center Shaw AFB S C Office of Operations Analysis
VISUAL RECONNAISSANCE IN TACTICAL AIR OPERATIONS.
Working paper,
Theodore H. Eklof. Dec 69, 60p Rept no. TARC-OA-WP-69-3

Descriptors: (*Visual perception, *Target recognition), (*Tactical air support, *Aerial reconnaissance), Visual acuity, Target acquisition, Performance (Human), Visibility, Military training, Night vision.
Identifiers: Visual observations.

Historically, visual reconnaissance has played a major part in tactical air operations. The report provides the pilot and observer with information to enhance this performance as visual observer. The most salient factors stressed herein are effective training for pertinent circumstances of operation, adequate briefing and preplanning, knowing where to look and what to look for, rehearsing, recognition of personal limitations, and preparing reports beforehand so that only blocks need to be filled in. The factors of target contrast, meteorological visibility, target size and other parameters are discussed and nomograms are provided for rapid and easy computations. (Author)

AD-757 569 PC$10.50/MF$0.95
Army Foreign Science and Technology Center Charlottesville Va
TECHNOLOGY AND ARMAMENT. NUMBER 10, 1972.
23 Feb 73, 169p Rept no. FSTC-HT-23-1285-73
Trans. of Tekhnika i Vooruzhenie (USSR) n10 Oct 72. The above journal is translated on a regular basis.

Descriptors: (*Armed forces operations, USSR), Logistics, Armament, Maintenance, Military training, Armed forces (Foreign), Propaganda, Combat readiness.
Identifiers: Translations.

Contents:
Armament, technology, and equipment;
Technical training;
The maintenance of combat equipment;
The creativity of the innovators;
AND In the armies of the capitalist states.

AD-757 626 PC$3.00/MF$0.95
Army Electronics Command Fort Belvoir Va Night Vision Lab
VISIONICS NIGHT VISION GOGGLE STUDY.
Final rept. Nov 70-Jul 71,
John Johnson, Ellen Tipton, Donald Newman, James Wood, and Gabriel Intano. Dec 72, 112p ECOM-7026

Descriptors: (*Night warfare, *Eyeglasses), Effectiveness, Night vision, Combat surveillance, Specifications, Simulators, Test methods, Reliability.
Identifiers: Night driving, *Night vision goggles.

The present report addresses the overall utility of the night vision goggles. Military effectiveness of the goggles over the unaided eye for night driving, close-order operations, patrol, and combat surveillance was evaluated by field experimentation. Identification of optical, electro-optical, and human-related factors was done through laboratory simulation and bench-test evaluations. Alternative approaches, as well as electro-optical specifications for individual night vision aides, were considered and evaluated. The 40 degrees FOV Night Vision Goggles provide a dual (passive-active), open-hatch, night-driving capability for armored vehicles. (Author Modified Abstract)

16. MISSILE TECHNOLOGY

16B. Missile Trajectories

SCL-DC-720087 PC$3.00/MF$0.95
Sandia Labs., Livermore, Calif.
REENTRY VEHICLE FINNED ROLL RATE CONTROL- AERODYNAMIC AND FLIGHT DYNAMIC ANALYSIS.
J. K. Kryvoruka, and W. T. Ashurst. Dec 72, 22p CONF-730103-2
Contract AT (29-1)-789
From Aiaa 11. Aerospace Sciences Meeting And Technical Display- Washington, D. C. (10 Jan 1973).

Descriptors: *Nose cones.

For abstract, see NSA 27 06, number 14432.

16C. Missile Warheads and Fuses

AD-757 150 PC$3.00/MF$0.95
Ballistic Research Labs Aberdeen Proving Ground Md
VACUUM ULTRAVIOLET RADIATION IN THE EXPANSION TUBE.
Memorandum rept.,
Fritz H. Oertel, Jr. Nov 72, 26p Rept no. BRL-MR-2249

Descriptors: (*Shock waves, Ultraviolet radiation), (*Reentry vehicles, *Blackout (Electromagnetic)), Fluorescence, Atoms, Gas ionization, Nitrogen, Argon, Mixtures, Air.
Identifiers: Far ultraviolet radiation.

The findings are presented of an optical survey of vacuum ultraviolet (VUV) radiation emitted from the shock layer of a 1-1/2 in. diameter sphere in hypersonic flows of air, argon, nitrogen and argon-nitrogen mixtures. Free stream velocities of 17,000-20,000 ft/sec and densities corresponding to altitudes of about 90,000 ft. were obtained in the BRL expansion tube facility; steady flow conditions prevailed over the model for about 75 microsec. The radiation was recorded on sensitized film down to a lower limit of 1100A. The purpose of the survey was to explore the feasibility of using this facility to measure time and space resolved radiation of the nonequilibrium, vibrationally-excited N2 in the shock layer; part of this radiation is conjectured to ionize O2 ahead of the shock around a hypersonic vehicle, thus enhancing its radar signature. Methods and problems of measuring VUV from this shock layer are discussed. (Author)

16D. Missiles

AD-757 212 PC$3.00/MF$0.95
Autonetics Anaheim Calif
SOFTWARE VALIDATION STUDY.
Final rept. Jul-Dec 72,
D. Bruce Brosius. Feb 73, 250p Rept no. C73-11/201 SAMSO-TR-73-99
Contract F04701-72-C-0370

Descriptors: (*Guided missile computers, *Programming (Computers)), Guided missiles (Surface-to-surface), Flight control systems, Ground support equipment, Systems engineering.
Identifiers: Minuteman, Minuteman 3 missiles, LGM-30G missiles, D37D computers.

The Software Validation Study was undertaken to provide an understanding and assessment of the process used to develop the software for a current ballistic missile system, the Minuteman III system, particularly the process of identifying software requirements and performing software testing. This information is intended to provide the foundation for development of advanced techniques to be applied to future software developments. (Author)

17. NAVIGATION, DETECTION, COMMUNICATIONS, AND COUNTERMEASURES

17A. Acoustic Detection

AD-757 253 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
INVESTIGATION OF A QUASI-HOLOGRAPHIC SYNTHETIC-APERTURE ACOUSTICAL IMAGING SYSTEM.
Master's thesis,
Robert George Driscoll. Dec 72, 44p

Descriptors: (*Sonar signals, Stereoscopic photography), Underwater sound signals, Underwater photography, Resolution, Experimental design, Theses.
Identifiers: *Acoustic holography, Side looking sonar, Holography, Image processing.

A side-looking sonar system which uses coherent electrical processing is investigated. Such a system produces a quasi-hologram of the reflected sound field which may be subsequently imaged to give a visual presentation of the insonified region. An actual working laboratory system is constructed and several quasi-holograms are depicted in the Data and Results section. Imaging is not completed, however, an optical processing arrangement to accomplish this task is presented. (Author)

AD-757 331 PC$3.00/MF$0.95
Naval Ordnance Lab White Oak Md
A DESCRIPTION OF THE MAPS ARRAY ANALYSIS PROGRAM,
Peter L. Eirich. 31 Oct 72, 285p Rept no. NOLTR-72-240

Descriptors: (*Hydrophones, Design), (*Computer programs, Instruction manuals), Performance (Engineering), Simulation.
Identifiers: AAP Computer program, Computerized simulation, FORTRAN.

The MAPS Array Analysis Program calculates performance parameters for arbitrary arrays of hydrophones. This report describes program organization and the use of the program. A program listing, descriptions of subroutines, and examples of the different program options are included as appendices. (Author)

17B. Communication

AD-757 017 PC$3.00/MF$0.95
Naval Undersea Center San Diego Calif
LIGHT-COUPLED THROUGH-THE-HULL INFORMATION TRANSMISSION.
Final rept. Jan 68-Jul 70,
Jack E. Holzschuh, and G. R. Beaman. Jan 73, 37p Rept no. NUC-TP-320

Descriptors: (*Underwater communication systems, *Light communication systems), Diodes (Semiconductor), Photodiodes, Multiplex, Underwater vehicles, Submarine hulls, Transparent panels, Command + control systems, Infrared receivers, Infrared transmitters, Acrylic resins, Digital systems.
Identifiers: Light emitting diodes, Time division multiplexing, Light coupled through the hull transmission.

The report covers the development of a light-coupled through-the-hull information transmission system. It describes the development of a light-emitting diode transmitter, a photodiode receiver, and a 6-bit, digital, time division multiplex system that uses the transmitter and receiver to demonstrate information transmission via a light beam. The final information transmission system covered in this report is the 64-bit command and control system used on NUC's transparent hull submersible Makakai. This system uses a modulated light beam and is capable of transmitting all of Makakai's command and control signals through the submersibles 2.5-inch-thick transparent acrylic hull. (Author)

AD-757 049 PC$3.00/MF$0.95
Stanford Research Inst Menlo Park Calif
SPEECH UNDERSTANDING RESEARCH.
Annual technical rept. 4 Oct 71-2 Oct 72,
Donald E. Walker. Feb 73, 61p
Contract DAHC04-72-C-0009, ARPA Order-1943

Descriptors: (*Speech, *Data processing systems), Speech recognition, Semantics, Syntax, Analysis, English language.
Identifiers: Computer aided analysis.

Progress is reported on a program of research on the analysis of continuous speech by computer. The goal is the development of a speech understanding system capable of engaging a human operator in a natural conversation about a specific problem domain. The approach being taken is distinctive in its use of syntactic and semantic processing to guide the acoustic analysis. (Author Modified Abstract)

AD-757 139 PC$3.00/MF$0.95
Army Electronics Command Fort Monmouth N J
BITERNARY FM SPECTRUM MEASUREMENTS.
Technical rept.,
John M. D'Andrea. Nov 72, 92p Rept no. ECOM-4050

Descriptors: (*Radio signals, Spectrum signatures), Power spectra, Frequency modulation, Bandwidth, Tactical warfare, Radio communication systems, Pulse code modulation.

Since the spectrum characteristics of a transmitted signal effect the performance of radio communications systems, the occupied bandwidth was measured for both binary FM and biternary FM signals. Results of the biternary FM spectrum measurements are described and compared with binary FM. (Author Modified Abstract)

AD-757 258 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
A PULSE POSITION MODULATED LASER COMMUNICATIONS SYSTEM.
Master's thesis,
John St. Clair Craighill. Dec 72, 53p

Descriptors: (*Light communication systems, Pulse position modulation), (*Voice communication systems, Light communication systems), Lasers, Irasers, Gallium arsenides, Photodiodes, Integrated circuits, Fiber optics, Lenses, Signal-to-noise ratio, Theses.
Identifiers: Gallium arsenide lasers, Light emitting diodes.

An optical communications system, suitable for simplex voice transmission is constructed, and demonstrated for straight line-of-sight, and for curved path operation using lenses and fiber optics. The system uses a pulsed gallium arsenide injection laser in the transmitter, operating at repetition frequency eight to fifteen kilohertz, and a p-i-n photodiode in the receiver. Pulse position modulation is used to transfer information as well as to trigger an avalanche transistor switch to drive the laser. (Author)

AD-757 326 PC$3.00/MF$0.95
Naval Submarine Medical Research Lab Groton Conn
THE EFFECT OF ELECTROACOUSTIC CHARACTERISTICS OF LOW-FIDELITY CIRCUITRY UPON SPEECH INTELLIGIBILITY.
Interim rept. no. 18,
J. Smaldino, and J. D. Harris. 8 May 72, 35p Rept no. NSMRL-707

Descriptors: (*Speech, *Intelligibility), Acoustic properties, Distortion, Signal-to-noise ratio, Gain, Circuits, Voice communication systems, Earphones.

Recorded speech tests were passed through 16 low-fidelity speech communication circuits, rated from good to poor, and listening panels underlined the key words heard. Mean scores among circuits (hearing aids) ranged from 53 to 75 per cent words correct. A total of 32 indices of electroacoustic characteristics was obtained or derived from measures of: transient, harmonic, intermodulation and frequency distortion; gain; and signal/noise ratio. Each index was correlated with speech intelligibility, and multiple correlations were derived for optimal prediction of speech intelligibility from a knowledge of the physical characteristics of any circuit. (Author Modified Abstract)

AD-757 329 PC$3.00/MF$0.95
Naval Submarine Medical Research Lab Groton Conn
PROCESSING HELIUM SPEECH: PROCEEDINGS OF A NAVY-SPONSORED WORKSHOP, AUGUST 1971.
Interim rept. no. 10,
Russell L. Sergeant, and Thomas Murry. 22 May 72, 81p Rept no. NSMRL-708

Descriptors: (*Speech, *Helium), (*Diving, Speech), Voice communication systems, Symposia, Pressure, Processing, Intelligibility.
Identifiers: *Helium speech.

Progress and future developments toward relaible speech communication under hyperbaric helium-oxygen conditions were assessed. Concepts of Helium-speech processing were advanced from straints allied to the unscrambler; that is, talker, listener, face mask and transducer. It was concluded that after a decade of research, the ability to correct hyperbaric helium speech finally exists. Now a system that is small, inexpensive, rugged and reliable must be designed and incorporated into diving operations. (Author Modified Abstract)

AD-757 342 PC$3.00/MF$0.95
Naval Electronics Lab Center San Diego Calif
INTEGRATED OPTICAL CIRCUITS.
Research and development rept. 1 Apr 72-1 Oct 72,
D. B. Hall. 30 Jan 73, 27p* Rept no. NELC-TR-1861
ARPA Order-2158

Descriptors: (*Light communication systems, Fiber optics), (*Waveguides, Semiconducting films), (*Modulators, *Electrooptics), (*Fiber optics, Waveguides), (*Light transmission, Waveguides), Multiplex, Integrated systems, Feasibility studies, Gallium arsenides, Zinc compounds, Zinc sulfides, Selenides.
Identifiers: Thin films, *Optical waveguides, Zinc selenides.

Work is reported on establishing the feasibility of integrated optics for use in high-capacity (multi-GHz) telecommunications and for implementing a militarily applicable, fiber-optic-transmission-line, multiterminal multiplexing system through low-loss coupling and modulation. More specifically, optical waveguiding in diffused-layer and heteroepitaxial thin-film semiconductor structures, both planar and three-dimensional, is demonstrated, as is electrooptic modulation in diffused-layer and heteroepitaxial thin-film semiconductor structures of high resistivity. In addition, optical propagation in fiber-optic waveguides is

theoretically analyzed, and future areas of research and development (particularly pattern delineation and optical coupling) and theoretical analysis are outlined. (Author)

AD-757 426 PC$3.00/MF$0.95
Florida Univ Gainesville Communication Sciences Lab
TALKER VARIATIONS AS RELATED TO INTELLIGIBILITY.
Technical rept.,
Harry Hollien, and Howard Rothman. 1 Dec 70, 21p Rept no. CSL/ONR-TR-31
Contract N00014-68-A-0173-0008
Report on Underwater Speech Communication. See also report dated 1 Jul 72, AD-751 665.

Descriptors: (*Speech, *Intelligibility), (*Diving, Speech), Analysis of variance, Verbal behavior, Auditory acuity, Underwater sound.

The aim of the study was to provide data that will contribute to the understanding of how variability among talkers may affect intelligibility test results; the two aspects under test in this study were (1) duration and (2) consonant-vowel amplitude ratios. Four most intelligible and four least intelligible talkers were identified from a sample of twenty adult males. Word samples common to both groups were identified on the criteria of being mostly understood and misunderstood by ten listeners. Results of acoustic evaluation of the word element demonstrated: that words receiving higher scores associated with more intelligible talkers where characterized by smaller consonant-vowel amplitude differences than the same words receiving lower intelligibility scores common to less intelligible talkers, and there were no significant differences in duration. (Author Modified Abstract)

AD-757 492 PC$3.00/MF$0.95
Texas Univ Austin Electronics Research Center
AUTOMATIC RECOGNITION OF SPOKEN ENGLISH WORDS.
Technical rept.,
Gary Lynn Hunt, and C. L. Coates. 28 Jul 72, 77p Rept no. TR-131 AFOSR-TR-72-1774
Contract F44620-71-C-0091

Descriptors: (*Speech, *Pattern recognition), (*English language, Pattern recognition), Data processing systems, Training.
Identifiers: Automatic language processing.

The object of the research was the development and testing of techniques for use in the recognition of spoken words. A trainable pattern classifier to recognize a limited vocabulary of spoken words was implemented using these techniques. The words used were spoken into a microphone located on the operator console in the Hybrid Computing Facility. Speech samples were processed by a 31-channel bandpass filterbank before digitization. Training was accomplished by first segmenting each spoken word into three time sections and then performing clustering operations on these segments to derive a set of prototype segments, along with estimated a priori probabilities of occurrence for these prototypes. The system was trained first on a single speaker and later on a group of five speakers, using the digits/zero/through/ine/as a test vocabulary. Recognition rates were generally from 94 to 98% on new data by the speakers for which the system was trained. (Author Modified Abstract)

AD-757 506 PC$3.00/MF$0.95
Aerospace Corp El Segundo Calif Lab Operations
ON RAINFALL AND SPACE DIVERSITY FOR MILLIMETER-WAVE EARTH-SATELLITE COMMUNICATIONS SYSTEMS.
Rept. for Jul 71-Jul 72,
Earl E. Reber, and D. V. McDonald. 15 Mar 73, 51p Rept no. TR-0073 (3230-01)-1 SAMSO-TR-73-90
Contract F04701-72-C-0073

Descriptors: (*Radio transmission, Surface-to-space), (*Space communication systems, Millimeter waves), (*Millimeter waves, Attenuation), Rainfall, Probability, Communication satellites (Active).
Identifiers: Space diversity, Spacecraft communication, *Atmospheric attenuation.

Space diversity, i.e., the use of several widely spaced terminals, is examined as a means of reducing the probability of simultaneous rainfall in millimeter-wave earth-satellite communications systems. The concept of space diversity, both as a function of the distance between terminals and the number of terminals is examined on the basis of hourly rainfall data for the 10-yr period from 1 January 1961 through 31 December 1970. The probabilities of simultaneous rainfall occurring in a space diversity system are shown to be a systematic function of the spacing and number of terminals in the system. (Author)

AD-757 551 PC$3.00/MF$0.95
Purdue Univ Lafayette Ind
NETWORK CONTROL FOR THE AIR FORCE SECTIONS OF THE DEFENSE COMMUNICATION SYSTEM.
Phase completion technical rept.,
Benjamin J. Leon, and T-C Huang. Dec 72, 33p RADC-TR-72-318
Contract F30602-72-C-0105

Descriptors: (*Global communication systems, Automation), Control systems, Flow charting, Graphics, Military requirements.
Identifiers: Network analysis (Management), *Defense Communication System, Network flows, Graph theory.

The Defense Communication System is the basic worldwide communication system for the armed forces of the United States. At the present time, operation and maintenance of the system is done through technical control centers at each installation. Some years ago the suggestion was advanced that the technical control centers be automated. The study involved considerations of controlling the entire network so that users get the best service possible under various conditions of network performance. (Author)

AD-757 553 PC$3.00/MF$0.95
Signatron Inc Lexington Mass
DIGITAL TROPOSCATTER EXPERIMENTS.
Final rept. Mar 71-Jul 72,
Leonard Ehrman, and James W. Graham. Jan 73, 169p Rept no. SIG-A-125 RADC-TR-72-350
Contract F30602-71-C-0177

Descriptors: (*Microwave communication systems, *Multipath transmission), Digital systems, Broadband, Errors, Attenuation, Modulation, Synchronization (Electronics), Information theory, New York.
Identifiers: *Tropospheric scatter communication.

Extensive measurements and predictions were made at 900 MHz to characterize the loss and multipath variations over the 168 mile Youngstown NY to Verona NY troposcatter link. Cumulative distributions of loss and multipath spread are in good agreement with predictions. Dual space and frequency diversity multipath analyses demonstrate that diversity receivers can use common timing provided the mean delays between paths are equalized. Time synchronization improvements made to a time-gated 3 Mbps coherent modem demonstrate that bit sync can be maintained reliably at signal levels well below those levels required for acceptable error rate and demultiplexer performance. (Author Modified Abstract)

AD-757 620 PC$3.00/MF$0.95
Army Electronics Command Fort Monmouth N J
ATTITUDE LINE GENERATOR FOR TELEVISION DISPLAYS.
Research and development technical rept.,
C. J. Capriglione, and E. A. Karcher. Mar 73, 25p Rept no. ECOM-4094

Descriptors: (*Television display systems, Attitude indicators), Generators, Symbols, Simulators.
Identifiers: Avionics, TASS (Tactical Avionics System Simulators), Tactical avionics system simulators.

The report describes the design of an attitude line generator for use with aircraft-type television displays. The attitude line appears as a continuous line that can be pitched and rolled through 360 degrees. The attitude line is in effect a special symbol generated for a television display. The hardware is used in the Tactical Avionics System Simulator (TASS) in support of the Night Low Level Program. (Author Modified Abstract)

AD-757 621 PC$3.00/MF$0.95
Army Electronics Command Fort Monmouth N J
CIRCULAR SYMBOL AND VIDEO INSET GENERATOR FOR TELEVISION DISPLAYS.
Research and development technical rept.,
C. J. Capriglione, and E. A. Karcher. Mar 73, 17p Rept no. ECOM-4095

Descriptors: (*Television display systems, *Flight instruments), Generators, Symbols, Simulators, Rings, Video signals.
Identifiers: TASS (Tactical Avionics System Simulators), Tactical avionics system simulators, Avionics.

The report describes the design of a circular symbol generators for use with television displays. These symbols can be used for presenting circles, ellipses or rings in the television raster. It can also be used for video insetting which enables a portion of two different video sources to be seen simultaneously one television screen. In this case, the inset would be circular or elliptical. The hardware is used in the Tactical Avionics System Simulator (TASS) in support of the Night Low Level Program. (Author Modified Abstract)

JPRS-58205 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
MONITORING NORTHERN HEMISPHERE TRANSMISSION IN ANTARCTICA AND SOME OBLIQUE SOUNDING SYSTEMS,
V. M. Dryatskii, and A. I. Taranov. 12 Feb 72, 34p Trans. of Arkticheskii i Antarkticheskii Nauchno-Issledovatelskii Institut. Trudy (USSR) v280 p115-126, 140-151 1966.

Descriptors: (*Radio transmission, Antarctic regions), (*Atmospheric sounding, Meteorological instruments), Radio links, High frequencies, Periodic variations, Translations, USSR, Polar cap absorption.
Identifiers: Oblique sounding systems.

The report discusses the peculiarities of shortwave transmissions between Antarctica and the Northern Hemisphere and a survey of some oblique sounding systems and the selection of a system for practical application. (Author)

N73-16125 PC$3.00/MF$0.95
Kentucky Univ., Louisville. Dept. of Electrical Engineering.
DEVELOPMENT OF COMMUNICATIONS ANALYSIS TECHNIQUES.
Final Report
R. D. Shelton. 30 Sep 72, 9p NASA-CR-130272, TR-EE-72-102
Contract NGR-18-002-026

Descriptors: *Computer programs, *Frequency modulation, *Linear systems, *Systems analysis, *Systems engineering, Communication equipment, Differential equations, Performance, Signal distortion.

For abstract, see STAR 11 07.

N73-16128 PC$28.00/MF$0.95
Magnavox Co., Silver Spring, Md. Advanced Systems Analysis Office.
DEFINITION OF MULTIPATH/RFI EXPERIMENTS FOR ORBITAL TESTING WITH A SMALL APPLICATIONS TECHNOLOGY SATELLITE.
Final Report
J. N. Birch, and R. H. French. 1 Dec 72, 516p
NASA-CR-128717, ASAO-PR20041-8
Contract NAS9-12705

Descriptors: *Applications technology satellites, *Earth satellites, *Multipath transmission, Radio frequency interference, Satellites, Signal processing, Space, Space communication.

For abstract, see STAR 11 07.

PATENT-3710261
Not Available - NTIS
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
DATA-AIDED CARRIER TRACKING LOOPS.
Patent
W. C. Lindsey, and M. K. Simon. Patented 9 Jan 73, 6p NASA-CASE-NPO-11282
Filed 24 Dec. 1970 Supersedes N71-33105 (09 - 20, P3242)
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: (*Phased locked communication, Patents).
Identifiers: PAT.CL. 325-346.

The characteristics of a data-aided carrier tracking loop are discussed. The loop signal to noise ratio is improved in a phase-locked loop used for tracking a carrier an angle modulated communications system by a quadrature channel added to the phase locked loop. A d.c. signal derived from the quadrature channel is added to the signal fed back to the voltage controlled oscillator in the otherwise conventional phase-locked loop.

PATENT-3710122.
Not Available - NTIS
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
LASER COMMUNICATION SYSTEM FOR CONTROLLING SEVERAL FUNCTIONS AT A LOCATION REMOTE TO THE LASER.
Patent
E. E. Burcher, C. W. Rowland, and A. R. Sinclair. Patented 9 Jan 73, 6p NASA-CASE-LAR-10311-1
Filed 24 Apr. 1970 Supersedes N70-35542 (08 - 19, P 3552)
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: (*Lasers, REMOTE CONTROL), Optical communication, Control equipment, Patents.
Identifiers: PAT.CL. 250-199.

A multichannel laser remote control system is described. The system is used in areas where radio frequency, acoustic, and hardware control systems are unsatisfactory or prohibited and where line of sight is unobstructed. A modulated continuous wave helium-neon laser is used as the transmitter and a 360 degree light collector serves as the antenna at the receiver.

17C. Direction Finding

PATENT-3708671
Not Available - NTIS
National Aeronautics and Space Administration, Washington, D.C.
SYSTEM FOR INDICATING DIRECTION OF INTRUDER AIRCRAFT.
Patent
A. W. Story. Patented 2 Jan 73, 8p
NASA-CASE-ERC-10226-1
Filed 16 Mar. 1971
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: Patents, *Warning systems, Aircraft detection.
Identifiers: PAT.CL. 250-209.

A pilot warning indicator system consisting of a flashing beacon, a detector, and an indicating panel is described. The detector responds to radiant energy from another aircraft's beacon by energizing particular signal lamps positioned in the periphery of the pilot's normal field of view. Since the positions of the energized lamps are related to the direction from which radiant energy is received by the detector, the pilot is apprised of the relative position of an intruder aircraft without any shift in visual fixation.

17E. Infrared and Ultraviolet Detection

AD-757 149 PC$3.00/MF$0.95
Ballistic Research Labs Aberdeen Proving Ground Md
A MODEL FOR PREDICTING THE SPECTRAL IRRADIANCE ON A GROUND TARGET FROM THE SUN AND THE CLEAR DAYTIME SKY.
Memorandum rept.,
Alan R. Downs. Sep 72, 61p Rept no. BRL-MR-2221

Descriptors: (*Surface targets, Spectrum signatures), (*Atmosphere models, Light transmission), Scattering, Absorption, Sky brightness, Target recognition, Infrared detectors, Sensors.
Identifiers: Radiative transfer, Atmospheric attenuation, *Remote sensing.

A single-scattering atmospheric radiative transfer model is derived and described. This model, based only on ground level measurements, can be used to predict the spectral and directional characteristics of radiation incident on a ground target from the sun and the cloudless daytime in the absence of discontinuities such as inversion layers. Wavelengths from 0.4 to 1.7 microns are considered. The model makes use of available information on the scattering and absorbing properties of atmospheric constituents and the distribution of these constituents with altitude. The final result is in the form of a function that can be integrated by computer to determine the spectral irradiance on the target from a preselected segment of the clear daytime sky. Detailed discussions of error sources and model limitations are included. (Author)

AD-757 361 PC$3.00/MF$0.95
Polytechnic Inst of Brooklyn Farmingdale N Y
BLEACHABLE ABSORBER LASER AMPLIFIER AND DETECTOR (BALAD).
Final rept. 18 Nov 70-17 Nov 71,
Gordon Gould, and James T. Latourrette. 23 Oct 72, 75p Rept no. PIBEP-72-107 RADC-TR-72-313
Contract F30602-71-C-0024, ARPA Order-1279

Descriptors: (*Infrared detectors, Design), (*Optdar, Infrared detectors), (*Light communication systems, Infrared detectors), Gas lasers, Irasers, Optical equipment components, Feasibility studies, Waveguides, Signal-to-noise ratio, Gain.
Identifiers: BALAD (Bleachable Absorber Laser Amplifier and Detector), Bleachable absorber laser amplifier and detector, Saturable absorbers, Xenon lasers, Carbon dioxide lasers.

A detailed feasibility and design study has been made on the wide-angle, low noise BALAD receiver (Bleachable Absorber Laser Amplifier and Detector). Expressions have been derived for the achievable field-of-view, maximum gain and other specifications in terms of the dimensions and the measurable properties of the laser and absorber gases. Virtually error free detection is assured for signal pulses > 100 photons. A figure-of-merit has been measured for several absorber gases screened from the literature. BALAD receivers with 4000 resolution element field-of-view are feasible using SF6 and a CO2 amplifier at 10.6micrometers and Xe with Xe at 3.5micrometers. The use of the latter is recommended for the experimental test of the BALAD receiver. Three compact absorber configurations have been considered and will be further investigated. Application is to optical radar and to optical communications where signal direction is uncertain. (Author)

17G. Navigation and Guidance

AD-757 051 PC$6.00/MF$0.95
Computer Systems Engineering Inc North Billerica Mass
COMPUTER-AIDED METERING AND SPACING WITH ARTS-III. PHASE II. DESIGN STUDY.
Interim rept. Dec 70-Dec 71.
Jul 72, 161p* FAA-RD-72-9
Contract DOT-FA70WA-2433

Descriptors: (*Air traffic control systems, Automation), Air traffic control terminal areas, Radar beacons, Adaptive control systems, Radar tracking, Scheduling, Operations research.
Identifiers: Automated radar terminal system, Sequencing, ARTS (Automated Radar Terminal System).

Phase II studies for a Metering and Spacing system (M+S) concept now being implemented are reported. Strategies for sequencing aircraft of like speed and weight class in groups rather than in their random order of arrival were found to have little prospective benefit in enhancing average landing rate as feeder fix holding penalties are incurred. Under IFR conditions, capacity benefits will be attained by fixing gate position for all aircraft. The use by the tracker of currently commanded vectors to more quickly reacquire aircraft after radar fades was examined. Techniques to automate and expedite runway changes were studied. Methods were developed to determine wind effect at various altitudes and correct the wind vector to be used in generating commands to subsequent aircraft. (Author)

AD-757 052 PC$3.00/MF$0.95
North American Systems Corp Londonderry N H
INFRARED INSPECTION OF AIR ROUTE TRAFFIC CONTROL CENTER (ARTCC) ELECTRICAL EQUIPMENT.
Final rept. Apr-Oct 72 on Phase 1,
Roger L. Hall, and Raymond J. Lutze. Oct 72, 66p
Rept no. C-208 FAA-RD-72-55
Contract DOT-FA72WA-2908

Descriptors: (*Air traffic control systems, Maintenance), (*Electrical equipment, Non-destructive testing), Infrared radiation, Reliability (Electronics), Cost effectiveness.
Identifiers: Preventive maintenance, Nashua (New Hampshire).

The electrical equipment at two ARTCC's was surveyed and current maintenance procedures reviewed to evaluate the applicability of IR inspection as a preventative maintenance tool. (Author)

AD-757 053 PC$3.00/MF$0.95
National Aviation Facilities Experimental Center Atlantic City N J
SQUARE WAVE VOR TESTS.
Final rept. Dec 71-Jul 72,
Louis A. Dvorsky. Feb 73, 111p Rept no. FAA-NA-72-60 FAA-RD-72-121

Descriptors: (*Radio beacons, Very high frequency), Radio navigation, Radio equipment, Tests.
Identifiers: *VOR, Square waves, Graphs (Charts).

Airborne and laboratory tests were performed on the 5X Square Wave VOR. Modification of both the ground facility and airborne receiver was necessary for an improvement in flyability due to suppression of reflected VOR signals. Compatibility flight tests were made using both modified and unmodified receivers on four-loop and SVOR facilities. Laboratory tests were performed on 12 different unmodified receivers to determine their response to sine and square wave modulation inputs. (Author)

AD-757 089 PC$3.00/MF$0.95
Transportation Systems Center Cambridge Mass
A FUNCTIONAL DESCRIPTION OF AIR TRAFFIC CONTROL.
Technical note,
J. R. Coonan, and P. Mpontsikaris. Apr 71, 89p
Rept no. TSC-FAA-71-4
Prepared in cooperation with Service Technology Corp., Cambridge, Mass.

Descriptors: (*Air traffic control systems, *Job analysis), (*Systems engineering, Air traffic control systems), Operation.

The document contains a description of air traffic control in terms of generic operational functions. The functions are grouped by flight phase and by major system function (navigation, surveillance, control and communication). More detailed descriptions of these functions, and estimates of related parameters are contained in the appendix. A diagram is shown of the sequence of events for a typical IFR flight through the current ATC system. Also, certain aspects of ATC which cannot be described in terms of operational functions (e.g., legal responsibilities) are discussed. (Author)

AD-757 142 PC$3.00/MF$0.95
Army Electronics Command Fort Monmouth N J
COASTLINE INDUCED LORAN-C ANOMALIES.
Technical rept.,
Chester W. Anderson, III, Douglas C. Pearce, and John W. Walker. Feb 73, 20p Rept no. ECOM-4075

Descriptors: (*Loran, Radio transmission), Anomalies, Seacoast, Numerical analysis.
Identifiers: Loran C.

In order to achieve better accuracy in position determinations when Loran-C manpack and airborne systems are used in proximity to land-sea boundaries, a program was initiated to measure the Loran-C environment in the vicinity of the Montauk Point coastline. Analysis of the lines of constant time difference over small areas showed the resultant variations to be local in extent and magnitude. It was concluded that these variations are probably a consequence of the incidence of the Loran-C pulse on the coastline. (Author)

AD-757 192 PC$3.00/MF$0.95
Polhemus Navigation Sciences Inc Burlington Vt
RADIO AIDS TO NAVIGATION FOR THE U. S. COASTAL CONFLUENCE REGION. USER REQUIREMENTS.
Interim rept. no. 1.
Mar 72, 150p Rept no. PNSI-TR-72-0354
Contract DOT-CG-22166-A
See also AD-757 193.

Descriptors: (*Hyperbolic navigation, Ships), Acceptability, United States, Accuracy, Safety, Economics, Boats.
Identifiers: Loran-C, Differential Omega navigation systems, Decca navigation systems, Coastal confluence region, Evaluation.

The report entails an unbiased technical evaluation of the capabilities of three candidate radio navigation systems (Loran-C, Decca and Differential Omega) to satisfy the requirements of mariners in the U. S. Coastal Confluence Region. This interim report develops the user requirements in the Coastal Confluence Region.

AD-757 193 PC$6.00/MF$0.95
Polhemus Navigation Sciences Inc Burlington Vt
RADIO AIDS TO NAVIGATION FOR THE U. S. COASTAL CONFLUENCE REGION. SYSTEMS EVALUATION.
Interim rept. no. 2.
Jun 72, 348p Rept no. PNSI-TR-72-0661
Contract DOT-CG-22166-A
See also AD-757 192 and AD-757 194.

Descriptors: (*Hyperbolic navigation, Ships), Systems engineering, United States, Acceptability, Deployment, Boats.
Identifiers: Loran-C, Differential Omega navigation systems, Decca navigation systems, Coastal confluence region, Evaluation.

The report entails an unbiased technical evaluation of the capabilities of three candidate radio navigation systems (Loran-C, Decca, and Differential Omega) to satisfy the requirements of mariners in the U.S. Coastal Confluence Region (CCR). To insure objectivity in the evaluation of the aids, three manufacturers, each representing one of the systems under consideration, were asked to present the strongest possible advocacy of their respective systems in the context required to meet the previously established, and agreed upon, operational requirement. All three configurations were normalized to this requirement to allow comparison and each advocate participated in advance of preparation of his proposal in the development of terms of reference and identification of relevant physical phenomena affecting performance. The report presents a summary and preliminary evaluation of the information received from the three Candidate Systems Advocates in response to the contractor's request that they describe the most effective way of deploying 'their' system to meet the user requirements. (Author Modified Abstract)

AD-757 194 PC$3.00/MF$0.95
Polhemus Navigation Sciences Inc Burlington Vt
RADIO AIDS TO NAVIGATION FOR THE U. S. COASTAL CONFLUENCE REGION.
Final rept.
Jul 72, 33p Rept no. PNSI-TR-72-0863
Contract DOT-CG-22166-A
See also AD-757 193 and AD-757 195.

Descriptors: (*Hyperbolic navigation, Ships), Systems engineering, United States, Acceptability, Safety, Economics, Boats.
Identifiers: Loran-C, Differential Omega navigation systems, Decca navigation systems, Coastal confluence region, Evaluation.

The report entails an unbiased technical evaluation of the capabilities of three candidate radio navigation systems (Loran-C, Decca and Differential Omega) to satisfy the requirements of mariners in the U.S. Coastal Confluence Region (CCR). To insure objectivity in the evaluation of the aids, three manufacturers, each representing one of the systems under consideration, were asked to present the strongest possible advocacy of their respective systems in the context required to meet the previously established, and agreed upon, operational requirement. All three configurations were normalized to this requirement to allow comparison and each advocate participated in advance of preparation of his proposal in the development of terms of reference and identification of relevant physical phenomena affecting performance. The operational requirements were reviewed by expert marine consultants and the physical factors affecting performance of radio navigation aids were reviewed by other experts. A scoring system was devised with the assistance and concurrence of the systems advocates. And, finally, each advocate was permitted a rebuttal. The report presents a summary of the user requirements and the results of the systems evaluation. (Author Modified Abstract)

AD-757 195 PC$3.00/MF$0.95
Polhemus Navigation Sciences Inc Burlington Vt
RADIO AIDS TO NAVIGATION FOR THE U. S. COASTAL CONFLUENCE REGION.
Supplemental rept.
Aug 72, 119p Rept no. PNSI-TR-72-0864
Contract DOT-CG-22166-A
See also AD-757 194.

Descriptors: (*Hyperbolic navigation, Ships), Boats, Systems engineering, United States, Configuration, Corrections, Acceptability.
Identifiers: Loran-C, Differential Omega navigation systems, Decca navigation systems, Coastal confluence region, Evaluation.

The report analyzes additional Differential Omega station configurations, the communication requirements to provide marine users with the Differential correction data and, assesses user attitudes towards planned phase-out of Loran-A and its replacement with either Decca, Loran-C, or Differential Omega. (Author Modified Abstract)

AD-757 238 PC$3.00/MF$0.95
National Aviation Facilities Experimental Center Atlantic City N J
TACAN-DME FALSE DISTANCE LOCK-ON.
Final rept. Aug 71-Jul 72,
George Hartranft, Matthew Naimo, and Harold Postel. Feb 73, 64p Rept no. FAA-NA-72-65 FAA-RD-72-98

Descriptors: (*Radio navigation, Performance (Engineering)), Distance-measuring equipment, Errors, Transponders, Radio equipment.
Identifiers: TACAN.

The report covers the results of laboratory and field tests of various TACAN ground station modifications designed to minimize the false DME problem. An airborne and ground data collection package was designed to record the percentage of false replies synchronous with an aircraft interrogation. The modifications tested included a modified GRN-9 TACAN receiver, a tighter decoder tolerance modification (Tulsa modification), a jittering dead time gate, and a retriggerable long dead time gate (Crazy Woman modification).

AD-757 268 PC$3.00/MF$0.95
IBM Federal Systems Div Gaithersburg Md
CONFLICT PREDICTION: DEMONSTRATION VERSION,
L. C. Paretti. Mar 70, 93p
See also report dated Jun 70, AD-757 269.

Descriptors: (*Air traffic control systems, Data processing systems), (*Flight paths, Interference), Programming (Computers), Flight instruments, Input-output devices, Graphics, Numerical analysis, Simulation, Radar tracking, Display systems.
Identifiers: IFR (Instrument Flight Rules), Instrument flight rules, Conflict prediction, Computerized simulation.

Conflict Prediction was developed to aid the controller in maintaining adequate separation between I.F.R. aircraft in an enroute environment. The scheme involves: detection of potential violations of separation standards; controller notification, so that positive action may be taken to avert the situation.

AD-757 269 PC$3.00/MF$0.95
IBM Federal Systems Div Gaithersburg Md
CONFLICT PREDICTION.
Final rept.,
W. E. Kister, L. C. Paretti, and D. S. Roberts. Jun 70, 147p
See also report dated Mar 70, AD-757 268.

Descriptors: (*Air traffic control systems, Data processing systems), (*Flight paths, Interference), Flight instruments, Programming (Computers), Graphics, Numerical analysis, Simulation, Radar tracking.

Identifiers: IFR (Instrument Flight Rules), Instrument flight rules, Conflict prediction, Computerized simulation.

The paper is concerned with the problem of predicting conflicts in the enroute air traffic environment. The over-all design presented is based on an interface with the NAS Ib system. However, the basic scheme is not dependent on the Model 1 environment. The x, y and z position and velocity components of the aircraft are the only data required for the performance of the prediction function.

AD-757 274 PC$3.00/MF$0.95
Transportation Systems Center Cambridge Mass
OCEANIC SURVEILLANCE AND NAVIGATION ANALYSIS, FY 72.
Final rept.,
Gilbert A. Gagne, and Ronald M. Hershkowitz.
Aug 72, 76p* Rept no. TSC-FAA-72-26 FAA-RD-72-142
See also AD-733 758.

Descriptors: (*Inertial navigation, Civil aviation), (*Aviation safety, Air traffic), (*Air traffic control systems, Atlantic Ocean), Aviation accidents, Flight paths, Separation, Models (Simulations), Standards.
Identifiers: Aircraft collision risk models, Parallel tracking systems, Satellite air traffic control surveillance systems, Separation standards surveillance.

The report summarizes the Oceanic Surveillance and Navigation Analysis performed, at or under the direction of, the Transportation Systems Center under PPA FA-204 for FY72. A methodology has been developed by Systems Control, Inc. for relating the safety (collision risk) of the North Atlantic organized Track System in the lateral dimension to the general characteristics of the onboard navigation system, the independent satellite surveillance system and the ATC procedures. The initiation of this effort by TSC was reported in TR DOT-TSC-FAA-71-13. The analysis and results are detailed herein. Extensions of this methodology to the latitude and vertical dimensions are also discussed and preliminary results are presented. A study has also been initiated to investigate and evaluate various configurations of aided inertial navigation system in the NAT region. The requirements, goals and contract award for the study are reviewed. (Author)

AD-757 444 PC$3.00/MF$0.95
National Bureau of Standards Washington D C
PSYCHOPHYSICAL EVALUATION OF ACOUSTIC NAVIGATION AIDS: PREFERENCE AND AVERSIVENESS.
Final rept.,
John A. Molino, and Gerald A. Zerdy. Oct 72, 42p
Rept no. NBS-10960

Descriptors: (*Navigational aids, Acoustic properties), (*Psychophysics, Navigational aids), Attitudes, Design, Fog, Applied psychology.

Ten college students gave preference judgments for four pure tones (120, 300, 500, and 835 Hz) and 11 tone composites constructed from combinations of the pure tones. The method of paired comparisons was used to compute the mean percent preferred for each stimulus and to construct a Thurstonian scale of preference. Equal aversion levels were also measured for the four pure tones and for five of the composites. In the aversiveness portion the same subjects pressed rapidly on a telegraph key to produce decrements in sound intensity on an FR 10 (DRH 0.2 s) schedule. If they failed to press, the intensity gradually increased. Asymptotic sound pressure levels maintained by the group after 7 min of responding were interpreted as equal tolerance limits for the stimuli. They were converted into sensation level measures to take into account the differential audibility of the signals. Certain operational conclusions were suggested for the design of acoustic navigation aids. (Author Modified Abstract)

AD-757 476 PC$3.00/MF$0.95
Champlain Technology Inc West Palm Beach Fla
EVALUATION OF THE OPERATIONAL, DESIGN AND SUPPORT ASPECTS OF CARTOGRAPHY FOR USE IN CIVIL AREA NAVIGATION MAP DISPLAYS. VOLUME II. APPENDICES.
Final rept. Jul 71-Apr 72.
Jul 72, 270p* FAA-RD-72-129-Vol-2
Contract DOT-FA71WA-2642
See also Volume 1, AD-757 554. Prepared in cooperation with Anacapa Sciences, Inc., Santa Barbara, Calif.

Descriptors: (*Maps, Display systems), (*Civil aviation, *Navigational aids), Mapping, Radio navigation, Cathode ray tube screens, Navigation charts, Instrument flight, Air traffic control systems, Distance-measuring equipment.
Identifiers: *Navigation map displays, *Moving map displays.

Six major issues concerning the cartographic support of map displays are identified and discussed. Analyses of the cartographic design and support factors are based upon previous research, the survey of map display systems, interviews with cartographers and map display designers, and the inventory and measurement of information contained on contemporary aeronautical charts. Finally, an extensive series of conclusions concerning the operational, design and support aspects of cartography for use in the 1975-80 airspace system are compiled. (Author Modified Abstract)

AD-757 554 PC$3.00/MF$0.95
Champlain Technology Inc West Palm Beach Fla
EVALUATION OF THE OPERATIONAL, DESIGN AND SUPPORT ASPECTS OF CARTOGRAPHY FOR USE IN CIVIL AREA NAVIGATION MAP DISPLAYS. VOLUME I. TECHNICAL.
Final rept. Jul 71-Apr 72.
Jul 72, 248p* FAA-RD-72-129-Vol-1
Contract DOT-FA71WA-2642
Prepared in cooperation with Anacapa Sciences, Inc., Santa Barbara, Calif. See also Volume 2, AD-757 476.

Descriptors: (*Maps, Display systems), (*Civil aviation, *Navigational aids), Mapping, Radio navigation, Cathode ray tube screens, Navigation charts, Instrument flight, Air traffic control systems, Distance-measuring equipment.
Identifiers: *Navigation map displays, *Moving map displays.

An evaluation of the operational aspects of cartography for use in civil area navigation operations was undertaken through an analysis of the 1975-80 U.S. domestic airspace environment. Supporting data for this analysis was collected through a series of observation flights in map display, area navigation and conventional VOR navigation-equipped aircraft. Eight potential roles for map displays are discussed. Through a series of ten simulated flights using a variety of conventional, area navigation and map display equipment, the cartographic information elements necessary to operate in the 1975-80 airspace are identified. As an adjunct to the operational analyses, the cartographic and display variables which affect the utility of a map display are analyzed. Six major issues concerning the cartographic support of map displays are identified and discussed. (Author Modified Abstract)

AD-757 586 PC$3.00/MF$0.95
Johns Hopkins Univ Silver Spring Md Applied Physics Lab
HYBRID SIMULATION FOR THE STUDY OF LORAN-C SIGNAL PROCESSING TECHNIQUES.
Technical memo.,
P. F. Bohn, and C. J. Nisson. Jan 73, 37p Rept no. APL-TG-1208
Contract N00017-72-C-4401

Descriptors: (*Loran, Simulation), Statistical distributions, Control sequences.
Identifiers: *Loran-C, *Signal processing, Hybrid simulation.

The Loran-C navigation system operates in a complex signal environment that contributes significantly to the system's reduced accuracy and reliability for ground position determination. The paper discusses a hybrid simulation that has been conceived to study this problem. The method used was to develop a signal-processing technique that would recognize and discard corrupt data. The analog computer was used to generate timing pulses and perform 5 mirosecs in-phase and quadrature integrations of the Loran-C signal. The results of the integration were stored in the digital computer for processing. The gaol was to achieve a positioning accuracy of 10 ns, an order of magnitude improvement over that of equipment presently available. (Author)

JPRS-58181 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
INERTIAL SYSTEMS,
V. A. Karelin, V. V. Savelev, S. G. Dadaev, E. I. Silv, and A. D. Kuznetsov. 7 Feb 73, 31p
Trans. of Izestiya Vysshikh Uchebnykh Zavedenii. Priborostroenie (USSR) v15 n11 p71-93 Nov 72.

Descriptors: (*Gyroscopes, *Instrument characteristics), Inertial navigation, Stabilized platforms, Drift (Instrumentation), Vibration, Spectrum signatures, Resonant frequency, Gas bearings, Oscillation, USSR, Translations.

The report contains articles on the construction of frequency spectrum of three-stage gyroscope with flexible rotor shaft and elastic cardan suspension mounts; on systematic drift of gyroscope with variable kinetic moment in cardan suspension during oscillations of platform; condition of drift invariance of two-stage gyroscope with arbitrary gas-lubricated main bearings to active accelerations; on the extremum problem of determining the plane of the meridian during the initial alignment of inertial systems; on hydraulic damping of the sensors of differential manometers of dynamic pressure logs. (Author)

JPRS-58356 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
BIAXIAL GYROSTABILIZER AND SUPERCONDUCTING SPHERICAL SUSPENSION,
V. G. Afonin, and B. A. Ryabov. 28 Feb 73, 14p
Trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Priborostroenie (USSR) v15 n12 p72-80 1972.

Descriptors: (*Gyrostabilizers, *Instrument characteristics), Inertial navigation, Inertial guidance, Drift (Instrumentation), Superconducting magnets, Magnetic fields, Translations, USSR.

The report contains articles on the application of averaging method to analysis of one gyroscopic system and on the synthesis of superconducting suspensions with maximum lift. (Author)

N73-16626 PC$7.00/MF$0.95
Massachusetts Inst. of Tech., Cambridge. Charles Stark Draper Lab.
GUIDANCE SYSTEM OPERATIONS PLAN FOR MANNED CSM EARTH ORBITAL AND LUNAR MISSIONS USING PROGRAM COLOSSUS 3.

SECTION 7 ERASABLE MEMORY PROGRAMS.
M. H. Hamilton. Oct 72, 97p NASA-CR-128689, R-577-REV-01
Contracts NAS9-4065, DSR PROJ. 55-23890

Descriptors: *Command service modules, *Computer programs, *Lunar module, *Spacecraft guidance, Apollo spacecraft, Binary digits, Numerical control, Spacecraft control.

For abstract, see STAR 11 07.

PB-215 709/7 PC$3.00/MF$0.95
Gilbert (Glen A.) and Associates, Washington, D.C.
DISTRIBUTED MANAGEMENT IN THE AIR TRAFFIC CONTROL SYSTEM,
Glen A. Gilbert. 11 Sep 72, 39p*

Descriptors: (*Air traffic control, Management planning), Radar beacons, Cost estimates, Display devices, Systems engineering.

A study was made to analyze the current planning of the Department of Transportation/Federal Aviation Administration and to recommend changes in the current DOT/FAA/ATCAC Third Generation planning in the light of the identified problem areas, and outline a new system plan as appropriate. (Author)

UCRL-51130 (VOL.2) PC$3.00/MF$0.95
California Univ., Livermore. Lawrence Livermore Lab.
FINAL REPORT ON THE DEVELOPMENT OF THE GEOGRAPHIC POSITION LOCATOR (GPL). VOLUME 2. EXECUTIVE SUMMARY.
J. D. Salisbury. 2 Nov 72, 20p
Contract W-7405-ENG-48

Descriptors: *Navigation, *Nuclear weapons.

For abstract, see NSA 27 06, number 12219.

17H. Optical Detection

N73-16220 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
AN EXPERIMENT TO DETERMINE THE RELATIVE POSITIONS OF TWO COLLOCATED LASER TRACKING STATIONS.
P. J. Dunn, R. Kolenkiewicz, and D. E. Smith. Nov 72, 14p NASA-TM-X-66158, X-553-72-497

Descriptors: *Lasers, *Position (location), *Tracking stations, Errors, Explorer 27 satellite, Performance tests.

For abstract, see STAR 11 07.

N73-16488 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
DESIGN AND ANALYSIS OF A STAR IMAGE MOTION COMPENSATOR.
K. C. Romanczyk, A. J. Ostroff, and W. E. Howell. Feb 73, 34p NASA-TN-D-7145, L-8634

Descriptors: *Image motion compensation, *Large space telescope, *Optical equipment, Astronomy, Equipment specifications, Imaging techniques.

For abstract, see STAR 11 07.

N73-16608 PC$4.00/MF$0.95
Deutsche Forschungs- Und Versuchsanstalt Fuer Luft- Und Raumfahrt, Oberpfaffenhofen (West Germany). Inst. Fuer Physik Der Atmosphaere.
THE DFVLR LIDAR SYSTEM-3 . DAS DFVLR--LIDAR-SYSTEM 3.
H. Herrmann, and C. Werner. Jun 72, 39p
DLR-MITT-72-26
Language German English Summary

Descriptors: *Atmospheric moisture, *Optical radar, *Water vapor, Absorption spectra, Line spectra, Moisture content, Ruby lasers, Troposphere.

For abstract, see STAR 11 07.

N73-16931 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
STUDIES RELATING TO TEMPERATURE CONTROL OF A LARGE SCALE TELESCOPE.
S. Katzoff. Feb 73, 63p NASA-TN-D-7174, L-8741

Descriptors: *Astronomical telescopes, *Mathematical models, *Temperature control, Heat pipes, Integral equations, Multilayer insulation, Radiative heat transfer, Temperature distribution, Thermal control coatings.

For abstract, see STAR 11 07.

17I. Radar Detection

AD-757 172 PC$3.00/MF$0.95
Alabama Univ Huntsville
MEASURE, CRITERIA AND PROCEDURE FOR TRACK AND SEARCH ALLOCATION.
Final technical rept. Feb 72-Feb 73,
Robert J. Polge, Edward R. McKee, Jr., B. K. Bhagavan, and Roy D. Hays. Feb 73, 133p Rept no. UAH-RR-138
Contract DAAH01-72-C-0585

Descriptors: (*Aircraft defense systems, *Radar tracking), (*Antimissile defense systems, Radar tracking), (*Antiaircraft defense systems, Radar tracking), Phased arrays, Automation, Computer programs, Optimization, Mathematical models, Search theory, Search radar, Aerial warfare.
Identifiers: Kalman filters, Control theory, Covariance matrix, Resource allocation, FORTRAN 4 programming language, FORTRAN.

A general procedure for radar resource allocation is presented. It requires the computation of the covariance matrix of the position estimates. Therefore, four estimation algorithms commonly used for track are evaluated and compared. A tracking measure applicable to the non-tactical EAR system is defined. Finally, a schema for track and search allocation is presented. An example illustrates how the tracking measure is computed and use in the track and search algorithm. (Author)

AD-757 220 PC$3.00/MF$0.95
Braddock Dunn and Mcdonald Inc Vienna Va
SIGNAL PROCESSING STUDY OF IMPULSE EXCITED OBJECTS IN SPACE.
Final technical rept. Jun 71-Sep 72,
V. C. Martins, and J. Van Meter. Jan 73, 243p Rept no. BDM/W-TR72-094 RADC-TR-72-347
Contract F30602-71-C-0158

Descriptors: (*Radar echo areas, Target discrimination), (*Radar targets, Backscattering), Radar pulses, Response, Mathematical models, Radar clutter, Electric filters, Optimization.
Identifiers: *Impulse radar, Pulsation, Signal processing.

The report contains the results of an investigation of optimum techniques for detecting and discriminating backscattered electromagnetic radiation associated with the impulse radar concept. The study reported herein is divided into three areas of investigation. The first of these is a study of backscatter in which several waveform variations for the sphere, rectangular plate, and thin rod geometries were determined mathematically tractable expressions for the scattered energy from typical geometrical shapes. The second part of this program involved the development of several optimal-like filter configurations based upon a knowledge of the characteristics of the waveforms of interest. Finally, the geometry identification problem was investigated.

AD-757 246 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
A DIGITAL COMPUTER PROGRAM FOR REAL-TIME COMPUTATION OF RADAR CROSS SECTION ON A DYNAMIC TARGET.
Master's thesis,
John Barry King. Dec 72, 54p

Descriptors: (*Radar echo areas, Analysis), (*Moving target indicators, Radar echo areas), (*Fire control system components, Fire control computers), Radar equipment, Data processing systems, Data transmission systems, Display systems, Real time, Computer programs, Theses.
Identifiers: Computer aided analysis.

The thesis describes the design and use of a computer program for the real-time computation of radar cross section of a dynamic target using the NIKE/AJAX radar. The program is written specifically for use on the SDS-9300/CI-5000 hybrid computer system but could be adapted to other data processing systems. The input data consists of transmitted values of range bearing and elevation from the NIKE/AJAX radar digital data buffer and sampled values of automatic gain control voltage and logrithmic amplifier output voltage from the NIKE/AJAX radar. Outputs include values of target range, bearing, elevation, velocity, heading, angle, X and Y positions, instantaneous values of target cross section and averaged values of target cross section. These computed quantities are converted into scaled voltages which are transmitted to displays in the radar laboratory. (Author Modified Abstract)

AD-757 259 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
RADAR RANGE-GATED MTI (MOVING TARGET INDICATOR) PROCESSOR.
Master's thesis,
Nejat Koral. Dec 72, 58p

Descriptors: (*Moving target indicators, Range gating), Search radar, Timing circuits, Radiofrequency filters, Band-pass filters, Wiring diagrams, Printed circuits, Theses, Shift registers, Relaxation oscillators.
Identifiers: AN/UPS-1, Schematic diagrams, Multivibrators.

Twenty range-gated channels and the associated timing circuits were constructed for implementation of a moving-target indicator (MTI) by range-gates and filters (RGF). Improvement over existing systems was accomplished by simplification in the range-gated channels. Elements of the system include both discrete and integrated circuits. A design objective was to achieve reliable and jitter-free gating pulses with timing flexibility. Performance of the system was tested in conjunction with the AN/UPS-1 air search radar. (Author)

AD-757 565 PC$3.00/MF$0.95
Massachusetts Inst of Tech Lexington Lincoln Lab
AN EXPERIMENTAL UHF GROUND SURVEILLANCE RADAR. VOLUME 2.
Technical rept.,
Lincoln Cartledge, and Robert D. Yates. 12 Oct 72, 76p Rept no. TR-497-Vol-2 ESD-TR-72-242
Contract F19628-73-C-0002, ARPA Order-1559

Descriptors: (*Coherent radar, Ultrahigh frequency), (*Search radar, Phased arrays), (*Moving target indicators, Ultrahigh frequency), Radar clutter, Plants (Botany), Penetration, Digital systems, Radar reflections, Power spectra.
Identifiers: Signal processing.

The volume describes the use of the radar as a measurements system for studying targets and the

clutter environment, in addition to its use for demonstrating the feasibility of radar detection of walking men in foliage. Investigations of target return spectra, clutter return spectra, and clutter return amplitude statistics are reported. Theoretical models relating clutter return spectra, and clutter return amplitude statistics are reported. Theoretical models relating clutter spectra to wind turbulence and tree resonances are presented and compared with experimental results. Similarly, a previous theoretical prediction of target return spectra is compared with experimental results. Clutter return amplitude statistics are measured and found to be Gaussian under certain conditions. Finally, the volume contains some comments on the relationships between the subclutter visibility and various parameters of digital MTI systems. (Author Modified Abstract)

AD-757 610 PC$3.00/MF$0.95
Army Missile Command Redstone Arsenal Ala Advanced Sensors Directorate
SOLID-STATE MONOPULSE RECEIVER FOR THE EXPERIMENTAL ARRAY RADAR.
Technical rept.,
William G. Briscoe, and Edward A. Strickland. Jan 73, 66p Rept no. RE-73-1

Descriptors: (*Radar receivers, *Monopulse radar), Phased arrays, Radar signals, Processing, Automatic gain control, Mixers (Electronics), Computer programs, Design.
Identifiers: Signal processing, Computer aided design, *Experimental array radar.

The receiver for the Experimental Array Radar is described. Design procedures, theory, construction, and test data are given. The receiver is a solid-state, superheterodyne, monopulse receiver. Four channels are required to process signals from two line phased array antennae. Three frequency conversion stages are used to convert C-band signals to bipolar video outputs. Sensitivity time control and automatic gain control are employed to increase reciever dynamic range. Computer-aided design techniques were used to design the stripline-balanced mixer and filter for the receiver front end. (Author)

AD-757 611 PC$3.00/MF$0.95
Army Missile Command Redstone Arsenal Ala Advanced Sensors Directorate
THE STATE VARIABLE APPROACH TO THE ANALYSIS OF SELECTING DIGITAL MOVING TARGET INDICATORS FILTERS.
Technical rept.,
Robert H. Fletcher, Jr. Feb 73, 76p Rept no. RE-73-5

Descriptors: (*Moving target indicators, Doppler effect), (*High-pass filters, Target discrimination), (*Aerial targets, *Radar tracking), Radar clutter, Integral transforms, Transfer functions, Control systems, Feedback, Mathematical models.
Identifiers: Digital filters, Control theory, Signal processing, Recursive filters.

A brief introduction to the digital Moving-Target-Indicator problem is presented along with a description of the conventional filters most commonly used for this purpose. The idea of initialization is then introduced for use with step scan radars, and the recursively implemented filter is proposed as a leading candidate for the Moving-Target-Indicator role. The essential features of the state variable approach are discussed and several useful relationships are developed. These expressions are then employed in the analysis of a number of filters, and some conclusions are drawn regarding the applicability of the state variable approach. (Author)

AD-757 624 PC$3.00/MF$0.95
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
ACCURACY STUDY OF THE T-9 RADAR.
Research and development technical rept.,
Edward M. D'Arcy. Mar 73, 36p ECOM-5480

Descriptors: (*Meteorological radar, Accuracy), Wind, Balloons, Radar tracking, Tables.
Identifiers: T-9 Radar.

In an effort to determine the accuracy of the T-9 radars, thirty jimspheres were released over a 4-day period in October 1971. These radars were used for determining winds to 10,000 feet above surface in the Atmospheric Sciences Laboratory unguided rocket real-time impact prediction system. Each jimsphere was tracked simultaneously by two T-9s and a cinetheodolite camera network. Using the cinetheodolites as a standard, mean differences and standard deviations were derived for each layer and for each profile. The results indicated that by using T-9 radars instead of the theodolite system, the standard deviation for the measured wind could be safely lowered. (Author)

N73-16130 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ANTENNA DIMENSIONS OF SYNTHETIC APERTURE RADAR SYSTEMS ON SATELLITES.
K. R. Richter. Jan 73, 16p NASA-TM-X-66162, X-730-73-9
Subm- Submitted for Publication

Descriptors: *Antenna design, *Apertures, *Satellite antennas, *Synthetic arrays, Antenna arrays, Antenna components, Product development.

For abstract, see STAR 11 07.

N73-16131 PC$3.00/MF$0.95
Illinois Univ., Urbana. Observatory.
DOPPLER FREQUENCY IN INTERPLANETARY RADAR AND GENERAL RELATIVITY.
Final Report
G. C. Mcvittie. Nov 72, 20p NASA-CR-130147
Contract NGR-14-005-088

Descriptors: *Doppler effect, *Interplanetary space, *Radar transmission, Gravitational fields, Mathematical models, Relativity, Schwarzschild metric, Space probes.

For abstract, see STAR 11 07.

N73-16652 PC$3.00/MF$0.95
Defence Research Establishment Ottawa (Ontario).
SOME PROBLEMS IN IRLS NOISE PATTERN IDENTIFICATION.
B. G. Young. Oct 72, 17p DREO-TN-72-25
Contract DRE PROJ. 38-80-07

Descriptors: *Electromagnetic noise, *Infrared imagery, *Infrared scanners, *Photointerpretation, Imaging techniques, Noise spectra, Pulse radar, Search radar, Tacan.

For abstract, see STAR 11 07.

17J. Seismic Detection

AD-757 199 PC$3.00/MF$0.95
Royal Norwegian Council for Scientific and Industrial Research Kjeller
PROGRESS REPORT, NORSAR PHASE 3, FOURTH QUARTER 1972.
Technical rept.,
E. S. Husebye. 5 Feb 73, 16p Rept no. NORSAR-53 ESD-TR-73-120
Contract F19628-70-C-0283, ARPA Order-800
See also AD-755 911.

Descriptors: (*Seismological stations, Norway), (*Underground explosions, Detection), Seismometers, Maintenance, Programming (Computers), Performance (Engineering).
Identifiers: NORSAR (NORwegian Seismic ARray), Norwegian seismic array.

The report covers the period 1 October - 31 December 1972 which is characterized by improving, estimating and simulating the array detection capability. All activities related to field work, repair and maintenance of field instrumentation are now located in a single facility at Stange close to Hamar. The operational performance of the field equipment has been satisfactory also in this reporting period. The implementation of the incoherent event detector in the software system has improved the array's event detectability approximately 15 per cent. A daily bulletin is edited, and is solely based on event detector data. Observed and predicted NORSAR event detectability using data from the first half ot 1972 have been worked out. Also potential detectability improvements as a function of more flexible bandpass filtering have been investigated. (Author)

AD-757 200 PC$3.00/MF$0.95
Royal Norwegian Council for Scientific and Industrial Research Kjeller
ARRAY MONITORING AND FIELD MAINTENANCE REPORT.
Rept. for 1 Jul-31 Dec 72,
O. Steinert, and A. Nilsen. 20 Jan 73, 120p Rept no. NOSAR-51 ESD-TR-73-121
Contract F19628-70-C-0283, ARPA Order-800

Descriptors: (*Seismological stations, Norway), (*Underground explosions, Detection), Seismometers, Maintenance, Analog systems.
Identifiers: NORSAR (NORwegian Seismic ARray), Norwegian seismic array.

The report, covering the period 1 July - 31 December 1972, discusses the field maintenance of the array, the remote array monitoring and their interaction. The routines for the maintenance and monitoring tasks, and the monitoring program package are described. All preventive and corrective maintenance projects initiated last period have with few exceptions been completed. An analog seismograph, located at NDPC, has been added to the date acquisition system. A new NORSAR maintenance center has been established at Stange. (Author Modified Abstract)

AD-757 202 PC$3.00/MF$0.95
Royal Norwegian Council for Scientific and Industrial Research Kjeller
SYSTEM OPERATIONS REPORT.
Technical rept. 1 Jul-31 Dec 71.
15 Jan 73, 56p Rept no. NORSAR-47 ESD-TR-73-122
Contract F19628-70-C-0283

Descriptors: (*Seismological stations, Norway), (*Underground explosions, Detection), Data processing systems, Communication systems, Seismometers, Maintenance, Statistical data.
Identifiers: NORSAR (NORwegian Seismic ARray), Norwegian seismic array.

The report covers the operation of the NORSAR system during the period 1 July - 31 December 1971, except for array monitoring and control and associated field maintenance, which activities are, covered by a separate report (NORSAR Report No. 40). A chapter on workshop repairs is, however, included here, although the main emphasis is on NDPC operations. (Author Modified Abstract)

AD-757 204 PC$3.00/MF$0.95
Royal Norwegian Council for Scientific and Industrial Research Kjeller
EVENT DETECTION AND LOCATION CAPABILITIES AT NORSAR.
H. Bungum. 29 Dec 72, 14p Rept no. NORSAR-49 ESD-TR-73-123
Contract F19628-70-C-0283

Descriptors: (*Seismological stations, Norway), (*Underground explosions, Detection), Seismic waves, Statistical analysis.
Identifiers: NORSAR (NORwegian Seismic ARray), Norwegian seismic array.

Data published in the NORSAR seismic bulletin between February and June 1972 has been studied in order to find estimates of the detectability and location accuracy at NORSAR. The detectability is calculated from empirical frequency-magnitude distributions, and the 90% cumulative detectability for the teleseismic zone (30 degrees < delta < 90 degrees) has been estimated at (m sub b) 4.0, while values for different regions vary from 3.7 to 4.3. These are all NORSAR magnitudes. The magnitude bias between NOAA and NORSAR has been found to be 0.15 plus or minus 0.31 in the teleseismic zone. In this zone, the median location difference between NOAA and NORSAR has been estimated at 160 km, with values for different regions ranging from 130 to 340 km. (Author)

AD-757 276 PC$3.00/MF$0.95
Philco-Ford Corp Billings Mont Communications and Technical Services Div
MONTANA LARGE APERTURE SEISMIC ARRAY.
Quarterly technical rept. no. 4, 1 Sep-30 Nov 72,
Robert E. Matkins. 15 Dec 72, 88p Rept no. TR-2056-72-28
Contract F33657-72-C-0390, ARPA Order-1620
See also report dated 15 Sep 71, AD-742 870.

Descriptors: (*Seismological stations, Montana), (*Underground explosions, Detection), Seismometers, Networks, Data processing systems, Analog systems, Calibration, Statistical analysis, Performance (Engineering), Operation, Maintenance, Sensitivity, Signal-to-noise ratio, Nuclear explosions.
Identifiers: LASA (Large Aperature Seismic Array), Large aperature seismic array, IBM 360/44 computers, PDP-7 computers, Vela Uniform.

The report relates the technical activity associated with the operation, maintenance, and improvement of the Montana Large Aperature Seismic Array (LASA) during the period 1 September - 30 November 1972. The short-period (SP) and long-period (LP) seismograph sensitivity performance statistics are indicated. Performance data on the SP seismometer, the SP high-level sensors, and the LP seismic amplifier are presented. Certain array surficial noise sources are identified. Development of a more comprehensive seismograph calibration technique for measurement of the amplitude and phase characteristics of the SP seismograph over a broad band of frequencies is reported. Progress with the installation of the SP channel CTH gain control modification is reported. Statistics relating to the operation and maintenance of the array and data center equipment and land facilities support are provided. (Author)

AD-757 526 PC$3.00/MF$0.95
Texas Instruments Inc Dallas Services Group
NEAR FIELD SMALL EARTHQUAKES - DISLOCATION MOTION.
Semi-annual technical rept. no. 1, 1 May-31 Oct 72,
Yi-Ben Tsai, Howard J. Patton, and T. W. Harley. 15 Nov 72, 62p AFOSR-TR-73-0496
Contract F44620-72-C-0073, ARPA Order-2134

Descriptors: (*Seismological stations, Data processing systems), (*Underground explosions, Detection), Faults (Geology), Seismic waves, Signal-to-noise ratio, Earthquakes, Power spectra, California.
Identifiers: Vela Uniform, San Fernando earthquake, Parkfield earthquake, Signal processing.

Fifty-one three-component strong motion records have been digitized in a unified file on magnetic tape for rapid processing of observed accelerograms. Computer programs have been developed to calculate theoretical velocity waveforms by differentiating displacement waveforms computed according to Haskell's dislocation model and to calculate experimental waveforms by integration of the digitized acceleration records. Linear and cubic least squares corrections of the accelerogram and the integrated velocity waveform respectively have been found to result in reasonably reliable experimental velocity waveforms for interpretation with a moving dislocation model. A theoretical velocity waveform based on a linear ramp dislocation source time function appears to be superior to one based on an exponential ramp function when compared with the experimental waveform to interpret observed records. Dislocation processes associated with Parkfield and San Fernando earthquakes have been determined using the moving dislocation model. (Author Modified Abstract)

AD-757 560 PC$3.00/MF$0.95
Massachusetts Inst of Tech Lexington Lincoln Lab
SEISMIC DISCRIMINATION.
Semiannual technical summary rept. 1 Jul-31 Dec 72,
David Davies. 31 Dec 72, 110p ESD-TR-72-354
Contract F19628-73-C-0002, ARPA Order-512

Descriptors: (*Seismological stations, Noise), (*Underground explosions, Detection), Seismometers, Networks, Rayleigh waves, Earthquakes, Nuclear explosions, Lithosphere, Sampling, Signal-to-Noise ratio, Power spectra, Sources, Faults (Geology), Spectrum signatures.
Identifiers: NORSAR (Norwegian Seismic Array), Norwegian seismic array, Vela uniform, LASA (Large Aperture Seismic Array), Large aperture seismic array, Seismic noise, *Seismic discrimination.

Studies of new array data are reported, with particular emphasis on the array NORSAR. Models for approach angle anomalies at LASA are presented. Further evidence for deep mantle lateral heterogeneity is given. Detailed analyses have been made of earthquakes in Eurasia. A microbarographic noise study has been completed. Continued progress is reported in the bulletin production from the month of intensive seismic analysis. (Author)

18. NUCLEAR SCIENCES AND TECHNOLOGY

CTC-INF-1043 PC$3.00/MF$0.95
Union Carbide Corp., Oak Ridge, Tenn. Computing Technology Center.
ENVIRONMENT FOR DIRECT INPUT TO THE AEC NUCLEAR MATERIALS INFORMATION SYSTEM.
D. A. Hyde. 16p CONF-720529-6
Contract W-7405-ENG-26
From 13. Annual Meeting Of The Institute Of Nuclear Materials Management- Boston, Ma (31 May 1972).

Descriptors: *Nuclear materials management.

For abstract, see NSA 27 06, number 12589.

DOCKET-RESARA-15 PC$3.00/MF$0.95
Westinghouse Electric Corp., Pittsburgh, Pa. Pwr Systems Div.
(WESTINGHOUSE NUCLEAR STEAM SUPPLY SYSTEM). REFERENCE SAFETY ANALYSIS REPORT, RESAR-3, AMENDMENT 2, REVISION 3.
Dec 72, 138p

Descriptors: *Reactors/ pressurized-water.

For abstract, see NSA 27 06, number 14213.

18A. Fusion Devices (Thermonuclear)

CONF-720705-6 PC$3.00/MF$0.95
Princenton Univ., N. J. Plasma Physics Lab.
WAVE GENERATION IN THE ST TOKAMAK NEAR THE ION CYCLOTRON FREQUENCY AND ITS SECOND HARMONIC.
J. C. Hosea, and W. M. Hooke. 1972, 3p
From 1. Topical Conference On Rf Plasma Heating- Lubbock, Tx (6 Jul 1972).

Descriptors: *Plasma wave phenomena, *Tokamak model st.

For abstract, see NSA 27 06, number 13777.

CONF-721058-1 PC$3.00/MF$0.95
Princeton Univ., N. J. Plasma Physics Lab.
DESIGN CONSIDERATIONS FOR DIVERTORS IN TOROIDAL FUSION REACTORS.
F. H. Tenney, and G. Lewin. 6p
Contract AT (11-1)-3073
From 7. Symposium On Fusion Technology- Grenoble, France (24 Oct 1972).

Descriptors: *Thermonuclear reactors, *Tokamak devices.

For abstract, see NSA 27 06, number 13740.

CONF-721111-17 PC$3.00/MF$0.95
Princeton Univ., N. J. Plasma Physics Lab.
PRINCETON REACTOR STUDIES PROGRAM.
R. G. Mills. 1972, 14p
Contract AT (11-1)-3073
From International Meeting On The Technology Of Controlled Thermonuclear Fusion Experiments And The Engineering Aspects Of Fusion Reactors- Austin, Tx (20 Nov 1972).

Descriptors: *Thermonuclear reactors.

For abstract, see NSA 27 06, number 13741.

CONF-730103-1 PC$3.00/MF$0.95
Oak Ridge National Lab., Tenn.
ENGINEERING PROBLEMS IN THE DESIGN OF CONTROLLED THERMONUCLEAR REACTORS.
A. P. Fraas. 1972, 11p
From Aiaa 11. Aerospace Sciences Meeting And Technical Display- Washington, D. C. (10 Jan 1973).

Descriptors: *Thermonuclear reactors.

For abstract, see NSA 27 06, number 13742.

FUPH-G-2 PC$3.00/MF$0.95
Flinders Univ. Of South Australia, Bedford Park. School Of Physical Sciences.
PROGRESS REPORT ON CONTROLLED FUSION RESEARCH.
M. H. Brennan. Oct 72, 26p
For Australian Atomic Energy Commission. U. S. Sales only

Descriptors: *Plasma, *Thermonuclear reactors.

For abstract, see NSA 27 06, number 13743.

JUL-860-PP PC$3.00/MF$0.95
Kernforschungsanlage, Juelich (West Germany). Institut Fuer Plasmaphysik.
CALCULATION OF HELICAL VACUUM-MAGNETIC FIELDS FOR HIGH-BETA-STELLARATORS.
P. Mioduszewski. Jun 72, 27p
Lang- In German. U. S. Sales only

Descriptors: *Stellarators.

For abstract, see NSA 27 06, number 13744.

LA-DC-72-1364 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.

NEUTRON FLUX SPECTRA AT LAMPF FOR CTR RADIATION DAMAGE STUDIES.
D. J. Dudziak, and M. A. Sherman. 1972, 23p CONF-721111-6
From International Meeting On The Technology Of Controlled Thermonuclear Fusion Experiments And The Engineering Aspects Of Fusion Reactors- Austin, Tx (20 Nov 1972).

Descriptors: *Aluminum, *Beryllium, *Carbon, *Neutron sources, *Protons, *Thermonuclear reactors.

For abstract, see NSA 27 06, number 12684.

LA-DC-72-1378 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
LASER CTR SYSTEMS STUDIES.
J. M. Williams. 1972, 27p CONF-721111-14
From International Meeting On The Technology Of Controlled Thermonuclear Fusion Experiments And The Engineering Aspects Of Fusion Reactors- Austin, Tx (20 Nov 1972).

Descriptors: *Lasers, *Thermonuclear reactors.

For abstract, see NSA 27 06, number 13746.

LA-DC-72-1397 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
PARAMETER STUDY OF A PULSED HIGH-BETA FUSION REACTOR BASED ON THE THETA PINCH.
S. C. Burnett, W. R. Ellis, and F. L. Ribe. 1972, 23p CONF-721111-5
From International Meeting On The Technology Of Controlled Thermonuclear Fusion Experiments And The Engineering Aspects Of Fusion Reactors- Austin, Tx (20 Nov 1972).

Descriptors: *Pinch devices.

For abstract, see NSA 27 06, number 13748.

LA-DC-72-1400 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
STAGED THETA PINCHES WITH IMPLOSION HEATING.
J. P. Freidberg, R. L. Morse, and F. L. Ribe. 1972, 27p CONF-721111-8
From International Meeting On The Technology Of Controlled Thermonuclear Fusion Experiments And The Engineering Aspects Of Fusion Reactors- Austin, Tx (20 Nov 1972).

Descriptors: *Pinch devices, *Plasma.

For abstract, see NSA 27 06, number 13749.

LA-DC-72-1407 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
FUSION REACTOR SYSTEMS.
F. L. Ribe. 1972, 28p CONF-721109-14
From International Conference On Nuclear Solutions To World Energy Problems- Washington, D. C. (12 Nov 1972).

Descriptors: *Magnetic mirror machines, *Pinch devices, *Thermonuclear reactors, *Tokamak devices.

For abstract, see NSA 27 06, number 13750.

LA-DC-72-1427 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
DISCRETE-ORDINATES NEUTRONIC ANALYSIS OF A REFERENCE THETA-PINCH REACTOR (RTPR).
D. J. Dudziak. 1972, 22p CONF-721111-7
From International Meeting On The Technology Of Controlled Thermonuclear Fusion Experiments And The Engineering Aspects Of Fusion Reactors- Austin, Tx (20 Nov 1972).

Descriptors: *Neutrons/ fusion, *Pinch devices.

For abstract, see NSA 27 06, number 13751.

LA-DC-72-1473 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
CONTEMPORARY CAPACITIVE ENERGY STORAGE SYSTEMS.
E. L. Kemp. 3p CONF-721202-7
From Nuclear Science Symposium And Exhibits-

Descriptors: *Electric capacitors, *Thermonuclear reactors.

For abstract, see NSA 27 06, number 13752.

LA-5121 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
REFERENCE THETA PINCH REACTOR (RTPR)- A STUDY OF A PULSED HIGH-BETA FUSION REACTOR BASED ON THE THETA PINCH.
S. C. Burnett, W. R. Ellis, T. A. Oliphant, and F. L. Ribe. Dec 72, 36p
Contract W-7405-ENG-36

Descriptors: *Pinch devices.

For abstract, see NSA 27 06, number 13745.

UCID-15386 PC$3.00/MF$0.95
California Univ., Livermore. Lawrence Livermore Lab.
HEAT PIPES AS A MEANS OF ENERGY REMOVAL FROM THERMONUCLEAR REACTOR VACUUM WALLS.
R. W. Werner. 24 Jul 72, 16p

Descriptors: *Heat pipes, *Thermonuclear reactors.

For abstract, see NSA 27 06, number 13753.

UCRL-74054 PC$3.00/MF$0.95
California Univ., Livermore. Lawrence Radiation Lab.
PROGRESS REPORT NO. 1 ON THE DESIGN CONSIDERATIONS FOR A LOW POWER EXPERIMENTAL MIRROR FUSION REACTOR.
R. W. Werner, G. A. Carlson, Jack Hovingh, J. D. Lee, and M. A. Peterson. 9 Nov 72, 94p CONF-721111-13
From International Meeting On The Technology Of Controlled Thermonuclear Fusion Experiments And The Engineering Aspects Of Fusion Reactors- Austin, Tx (20 Nov 1972).

Descriptors: *Magnetic mirror machines.

For abstract, see NSA 27 06, number 13754.

UCRL-74057 (REV.1) PC$3.00/MF$0.95
California Univ., Livermore. Lawrence Livermore Lab.
SOME PROBLEMS ASSOCIATED WITH TRITIUM IN FUSION REACTORS.
R. G. Hickman. 15 Sep 72, 46p CONF-721111-16
From International Meeting On The Technology Of Controlled Thermonuclear Fusion Experiments And The Engineering Aspects Of Fusion Reactors- Austin, Tx (20 Nov 1972).

Descriptors: *Thermonuclear reactors, *Tritium.

For abstract, see NSA 27 06, number 13755.

UCRL-74057 (REV.2) PC$3.00/MF$0.95
California Univ., Livermore. Lawrence Livermore Lab.
SOME PROBLEMS ASSOCIATED WITH TRITIUM IN FUSION REACTORS.
R. G. Hickman. 25 Oct 72, 48p CONF-721111-11
From International Meeting On The Technology Of Controlled Thermonuclear Fusion Experiments And The Engineering Aspects Of Fusion Reactors- Austin, Tx (20 Nov 1972).

Descriptors: *Thermonuclear reactors, *Tritium.

For abstract, see NSA 27 06, number 13756.

UCRL-74096 PC$3.00/MF$0.95
California Univ., Livermore. Lawrence Livermore Lab.
DESIGN STUDY OF A 14,000-AMPERE INJECTION SYSTEM FOR A FUSION REACTOR.
G. W. Hamilton, and J. E. Osher. 23 Aug 72, 20p CONF-721111-15
From International Meeting On The Technology Of Controlled Thermonuclear Fusion Experiments And The Engineering Aspects Of Fusion Reactors- Austin, Tx (20 Nov 1972).

Descriptors: *Plasma accelerators.

For abstract, see NSA 27 06, number 13757.

UCRL-74096 (REV.1) PC$3.00/MF$0.95
California Univ., Livermore. Lawrence Livermore Lab.
DESIGN STUDY OF A 14,000-AMPERE INJECTION SYSTEM FOR A FUSION REACTOR.
G. W. Hamilton, and J. E. Osher. 25 Oct 72, 37p CONF-721111-10
From International Meeting On The Technology Of Controlled Thermonuclear Fusion Experiments And The Engineering Aspects Of Fusion Reactors- Austin, Tx (20 Nov 1972).

Descriptors: *Plasma accelerators, *Thermonuclear reactors.

For abstract, see NSA 27 06, number 13758.

18B. Isotopes

COO-3333-1 PC$3.00/MF$0.95
Massachusetts General Hospital, Boston. Physics Research Lab.
POSITRON SCANNING WITH COMPUTER INTERFACE. TECHNICAL PROGRESS REPORT, JANUARY 1, 1971-OCTOBER 31, 1971.
G. L. Brownell. 6 Dec 71, 19p
Contract AT (11-1)-3333

Descriptors: *Positron cameras, *Radioisotopes.

For abstract, see NSA 27 06, number 12209.

COO-3333-2 PC$3.00/MF$0.95
Massachusetts General Hospital, Boston.
POSITRON SCANNING WITH COMPUTER INTERFACE. TECHNICAL PROGRESS REPORT, JANUARY 1-JULY 31, 1972.
G. L. Brownell. 2 Aug 72, 13p
Contract AT (11-1)-3333

Descriptors: *Positron cameras, *Radioisotopes.

For abstract, see NSA 27 06, number 12210.

GULF-RT-A-12280 PC$3.00/MF$0.95
Gulf Radiation Technology, San Diego, Calif.
/SUP 252/CF IN ISOTOPIC SOURCE ASSAY SYSTEMS FOR NUCLEAR MATERIALS. FINAL TECHNICAL REPORT.
D. Costello, W. Gallagher, T. Gozani, and H. Kendrick. 14 Nov 72, 74p
Contract AT (38-1)-730

Descriptors: *Californium isotopes cf-252, *Nuclear materials management.

For abstract, see NSA 27 06, number 12590.

PG-INF. SER.-25 PC$3.00/MF$0.95
United Kingdom Atomic Energy Authority, Capenhurst (England). Production Group.
BIBLIOGRAPHY ON ISOTOPE SEPARATION BY THE GAS CENTRIFUGE. PART 1. BOOKS,

REPORTS, JOURNAL ARTICLES, AND CONFERENCE PAPERS.
G. E. Lowe. Apr 70, 100p
U. S. Sales only

Descriptors: *Bibliographies, *Gas centrifuges, *Isotope separation methods.

For abstract, see NSA 27 06, number 12249.

RD/B/N-2375 PC$3.00/MF$0.95
Central Electricity Generating Board, Berkeley (England). Berkeley Nuclear Labs.
EFFECT OF FLOW ON MASS TRANSPORT OF AN ADSORBING, RADIOACTIVE SPECIES IN A POROUS MEDIUM.
R. S. Rodliffe. Sep 72, 11p RPC/M3FPR/P- (72)23, RPC/CA/N- (72)15
U. S. Sales only

Descriptors: *Gas flow, *Radioisotopes.

For abstract, see NSA 27 06, number 12479.

RFP-1883 PC$3.00/MF$0.95
Dow Chemical U.s.a., Golden, Colo. Rocky Flats Div.
ANNOTATED BIBLIOGRAPHY OF /SUP 252/CF.
E. S. Salazar, and D. G. Vasilik. 21 Dec 72, 13p
Contract AT (29-1)-1106

Descriptors: *Bibliographies, *Californium isotopes cf-242.

For abstract, see NSA 27 06, number 13551.

18C. Nuclear Explosions

AD-757 414 PC$3.00/MF$0.95
Mission Research Corp Santa Barbara Calif
MICE: AN IMPLICIT DIFFERENCE SCHEME FOR MHD CALCULATIONS.
Interim rept.,
Frederic E. Fajen. Mar 73, 38p Rept nos. MRC-R-12, MRC-IR-72-029 DNA-2877Z
Contract DASA01-71-C-0054

Descriptors: (*Nuclear explosions, Magnetohydrodynamics), (*Magnetohydrodynamics, *Programming (Computers)), Fluid flow, Partial differential equations, Difference equations, Shock waves, Explosion bubbles, Numerical analysis.
Identifiers: MICE computer code, Nuclear fireball.

The report describes the MICE code, which uses new numerical technique for solving the one fluid MHD equations. Although the technique evolved from some of the general ideas developed by Harlow and Amsden in their ICE (Implicit, Continuous-Fluid, Eulerian) method, it has been extensively modified, and is best described as an implicit Lax-Wendroff technique. The approximation of time-step-splitting is used, which greatly simplifies the numerical solution. Some numerical results are presented for two test problems. The MICE computation of the early expansion and rise of a hot bubble in an exponential atmosphere is compared to previously published calculations of the same problem. The buoyant rise of a warm infinitely long cylinder is calculated and the shape of the boundary is compared to an exact solution obtained by G. McCartor of MRC. The agreement is satisfactory in both cases. (Author)

AWRE-O-49/72 PC$3.00/MF$0.95
Atomic Weapons Research Establishment, Aldermaston (England).
SOME SEISMIC RESULTS FROM A WORLD WIDE SAMPLE OF LARGE UNDERGROUND EXPLOSIONS.
P. D. Marshall. Oct 72, 100p
U. S. Sales only

Descriptors: *Nuclear explosions/ underground, *Seismic waves.

For abstract, see NSA 27 06, number 11948.

JAB-99-93 PC$3.00/MF$0.95
Blume (John A.) And Associates Research Div., San Francisco, Calif.
STATISTICAL CORRELATION OF OBSERVED GROUND MOTION WITH LOW-RISE BUILDING COMPONENT DAMAGE- PROJECT RULISON.
R. E. Scholl, and I. Farhoomand. Jan 73, 49p
Contract AT (26-1)-99

Descriptors: *Ground, *Nuclear explosions/ underground, *Structures.

For abstract, see NSA 27 06, number 11949.

PNE-RB-34 PC$3.00/MF$0.95
Cer Geonuclear Corp., Las Vegas, Nev.
PROJECT RIO BLANCO, FEASIBILITY STUDY, PICEANCE BASIN, COLO.
16 Apr 70, 132p

Descriptors: *Natural gas, *Nuclear explosions/ underground.

For abstract, see NSA 27 06, number 11950.

PNE-WW-13 PC$3.00/MF$0.95
El Paso Natural Gas Co., Tex.
TECHNICAL STUDIES REPORT NUMBER TWO. PROJECT WAGON WHEEL.
1 Oct 72, 214p

Descriptors: *Natural gas, *Nuclear explosions/ underground, *Radiation monitoring, *Radioactivity, *Rocks.

For abstract, see NSA 27 06, number 11951.

UCRL-74017 PC$3.00/MF$0.95
California Univ., Livermore. Lawrence Livermore Lab.
CALCULATION OF ROCK FRACTURING FROM MULTIPLE NUCLEAR EXPLOSIVE SOURCES.
R. W. Terhune, and J. G. Shaw. 31 Oct 72, 38p CONF-721108-7
From Pne Panel Meeting- Vienna, Austria (26 Nov 1972).

Descriptors: *Nuclear explosions/ underground, *Rocks.

For abstract, see NSA 27 06, number 11952.

UCRL-74306 PC$3.00/MF$0.95
California Univ., Livermore. Lawrence Livermore Lab.
COMPARISON OF COMPUTER MODEL PREDICTIONS OF NUCLEAR EXPLOSION EFFECTS IN HOGGAR GRANITE WITH EXPERIMENTAL MEASUREMENTS.
R. W. Terhune. 8 Nov 72, 17p CONF-721126-1
From 2. French-american Technical Exchange Of Geologic Information Relating To Peaceful Uses Of Nuclear Explosives- Paris, France (20 Nov 1972).

Descriptors: *Granites, *Nuclear explosions/ underground, *Sandstone.

For abstract, see NSA 27 06, number 11953.

18D. Nuclear Instrumentation

AD-757 462 PC$3.00/MF$0.95
Grumman Aerospace Corp Bethpage N Y Research Dept
HIGH SPATIAL RESOLUTION MULTIWIRE PROPORTIONAL CHAMBER SYSTEMS USING ELECTROMAGNETIC DELAY LINE READOUTS.
Research memo.,
F. R. Swanson, F. J. Kuehne, and A. J. Favale.
Feb 73, 11p Rept no. RM-569J

Descriptors: (*Proportional counters, Delay lines), (*Cosmic rays, Proportional counters), X rays, Pulse height analyzers, Space environmental conditions, Discriminators.

The report describes results of an investigation to develop multiwire proportional chamber systems using electromagnetic delay lines for high resolution cosmic ray experiments. The delay line used is a plexiglas core type, with a delay constant of 7 nsec/mm. The interpolation properties of this readout scheme resulted in a measured spatial resolution of 75 microns (HWHM) using iron-55 X-rays and a wire spacing of 1 mm. Tracking accuracy over a 6 mm region near the center of the chamber was better than plus or minus microns when fitted to a linear spatial dependence combined with a sinusoid of wire-spacing periodicity. (Author)

HEDL-SA-442 PC$3.00/MF$0.95
Hanford Engineering Development Lab., Richland, Wash.
EFFECTS OF GAS MIXTURE, ELECTRODE SPACING, GAS PRESSURE, AND APPLIED VOLTAGE ON THE GAMMA PERFORMANCE OF FISSION COUNTERS.
N. C. Hoitink, L. D. Philipp, and M. R. Wood. 3 Oct 72, 24p CONF-721109-12
Contract AT (45-1)-2170
From International Conference On Nuclear Solutions To World Energy Problems- Washington, Dc (12 Nov 1972).

Descriptors: *Liquid metal fast breeder reactor, *Radiation detectors/ fission chamber.

For abstract, see NSA 27 06, number 12002.

IFVE-SEF-71-45 PC$3.00/MF$0.95
Gosudarstvennyi Komitet Po Ispol'Zovaniyu Atomnoi Energii Ssr, Serpukhov. Institut Fiziki Vysokikh Energii.
INVESTIGATION OF A UNIVIBRATOR WITH LINEAR ADJUSTMENT OF THE DURATION IN A WIDE TIME RANGE.
V. A. Krendelev, and V. Ya. Uglekov. 1971, 16p
Lang- In Russian. U. S. Sales only

Descriptors: *Circuits.

For abstract, see NSA 27 06, number 12211.

INR-P-1423 PC$3.00/MF$0.95
Institute Of Nuclear Research, Warsaw (Poland).
ANOMALOUS REFLECTION IN NEUTRON TRIPLE AXIS CRYSTAL SPECTROMETER.
E. Maliszewski, J. Sosnowski, and S. Bednarski. 1972, 10p
U. S. Sales only

Descriptors: *Neutron spectrometers.

For abstract, see NSA 27 06, number 12123.

JINR-P10-6655 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Problems.
KATOK-B PROGRAM.
V. Gadzhokov. 1972, 8p
Lang- In Russian. U. S. Sales only

Descriptors: *Computer programs, *Gamma spectrometers.

For abstract, see NSA 27 06, number 12124.

JINR-P13-6759 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Problems.
MANUFACTURING AND EXAMINATION OF CE (LI) DETECTORS.
Ts. Vylov, I. N. Egoshin, M. G. Marinov, T. M. Muminov, and B. P. Osipenko. 1972, 18p
Lang- In Russian. U. S. Sales only

Descriptors: *Radiation detectors.

For abstract, see NSA 27 06, number 12003.

LA-DC-72-1119 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
SPECTROMETER DESIGN AT LASL.
H. A. Thiessen, and M. M. Klein. 26p
CONF-720908-12
From 4. International Conference On Magnet Technology- Upton, Ny. (19 Sep 1972).

Descriptors: *Spectrometers.

For abstract, see NSA 27 06, number 12683.

LA-DC-72-1347 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
ON-LINE DIAGNOSTIC TECHNIQUE TO IMPROVE INSTRUMENTATION SYSTEM AVAILABILITY.
H. H. Helmick. 9p CONF-721123-1
From Isea Specialists' Meeting On Application Of Reliability Analysis To Control And Instrumentation Systems- Kjeller, Norway (30 Nov 1972).

Descriptors: *Counting devices, *Electronic equipment.

For abstract, see NSA 27 06, number 12214.

LBL-1 (VOL.3) PC$3.00/MF$0.95
California Univ., Berkeley. Lawrence Berkeley Lab.
INSTRUMENTATION FOR ENVIRONMENTAL MONITORING- RADIATION.
1 May 72, 297p

Descriptors: *Accelerators, *Gamma radiation, *Laser radiation, *Microwaves, *Neutrons, *Radiation detectors, *Radiation dosimeters, *Ultraviolet radiation, *X radiation.

For abstract, see NSA 27 06, number 12005.

LBL-911 PC$3.00/MF$0.95
California Univ., Berkeley. Lawrence Berkeley Lab.
DESIGN OF THE HIGH RESOLUTION SPECTROMETER BENDING MAGNETS FOR LASL.
Egon Hoyer, and Jack Gunn. Sep 72, 8p
CONF-720908-26
Contract W-7405-ENG-48
From 4. International Conference On Magnet Technology- Upton, Ny (19 Sep 1972).

Descriptors: *Magnets.

For abstract, see NSA 27 06, number 12685.

ORNL-TM-3959 PC$3.00/MF$0.95
Oak Ridge National Lab., Tenn.
NEUTRON SENSOR DEVELOPMENT FOR EXTREME ENVIRONMENTS PROGRESS REPORT FOR PERIOD JANUARY 1, 1971 TO JUNE 30, 1972.
D. P. Roux. Dec 72, 39p
Contract W-7405-ENG-26

Descriptors: *Liquid metal fast breeder reactor, *Neutrons, *Radiation detectors/ fission chamber.

For abstract, see NSA 27 06, number 12007.

SC-DR-720851 PC$3.00/MF$0.95
Sandia Labs., Albuquerque, N. Mex.
HIGH ACCURACY CALIBRATION TECHNIQUES FOR INTENSE RELATIVISTIC ELECTRON BEAM MONITORS.
P. E. Bolduc, A. R. Phillips, and W. H. Vandevender. Nov 72, 81p

Descriptors: *Beam monitors, *Electron beams, *Faraday cups, *Magnetic probes.

For abstract, see NSA 27 06, number 12632.

TID-26238 PC$3.00/MF$0.95
Washington Univ., Seattle.
PROTON RECOIL DETECTOR CALIBRATION USING RESONANCE FILTERS.
B. G. Twining. 1970, 82p
Thesis.

Descriptors: *Neutrons, *Radiation detectors/ proportional.

For abstract, see NSA 27 06, number 12009.

18E. Nuclear Power Plants

CONF-701074-3 PC$3.00/MF$0.95
HIGH-POWER STEAM GENERATORS FOR ATOMIC ELECTRIC POWER PLANTS WITH WATER-MODERATED WATER-COOLED REACTORS.
V. F. Titov, V. I. Grishakov, G. A. Tarankov, V. G. Suprunov, and V. P. Denisov. 10p

Descriptors: *Boilers, *Reactors/ power, *Reactors/ water-cooled.

For abstract, see NSA 27 06, number 14070.

CONF-720846-1 PC$3.00/MF$0.95
Australian Atomic Energy Commission.
NUCLEAR POWER- WORLD AND AUSTRALIAN SITUATION IN PERSPECTIVE.
K. F. Alder. Aug 72, 29p
From 44. Congress Of The Australian And New Zealand Association For The Advancement Of Science Symposium- Sydney, Australia (14 Aug 1972). U. S. Sales only

Descriptors: *Australia, *Reactors/ power.

For abstract, see NSA 27 06, number 14024.

DOCKET-1151-61 PC$3.00/MF$0.95
Directorate Of Regulatory Operations (Aec), Glen Ellyn, Ill. Region Iii.
ELK RIVER REACTOR. STEPS TAKEN TO CORRECT ITEM OF NONCOMPLIANCE BROUGHT TO ATTENTION IN LETTER DATED DECEMBER 4, 1972.
4 Dec 72, 20p

Descriptors: *Elk river power reactor.

For abstract, see NSA 27 06, number 14126.

DOCKET-50003-149 PC$3.00/MF$0.95
Consolidated Edison Co. Of New York, Inc., New York.
INDIAN POINT STATION, UNIT 1. LEAKY VALVE DECEMBER 12, 1972. FLUX FLOW COMPUTER SCRAM DECEMBER 19, 1972. DESUPERHEATING WATER LINE FAILED DECEMBER 29, 1972.
5 Jan 73, 7p

Descriptors: *Indian point power reactor/ unit 1.

For abstract, see NSA 27 06, number 14080.

DOCKET-50003-150 PC$3.00/MF$0.95
Directorate Of Licensing (Aec), Washington, D. C.
INDIAN POINT STATION, UNIT 1. TECHNICAL SPECIFICATIONS, REQUEST FOR ADDITIONAL INFORMATION, METEOROLOGY.
28 Nov 72, 2p

Descriptors: *Indian point power reactor/ unit 1.

For abstract, see NSA 27 06, number 14127.

DOCKET-50029-221 PC$3.00/MF$0.95
Yankee Atomic Electric Co., Westboro, Mass.
YANKEE NUCLEAR POWER STATION. DIESEL GENERATOR COOLANT HOSE FAILURE.
10 Jan 73, 2p

Descriptors: *Yankee power reactor.

For abstract, see NSA 27 06, number 14081.

DOCKET-50133-102 PC$3.00/MF$0.95
Pacific Gas And Electric Co., San Francisco, Calif.
HUMBOLDT BAY POWER PLANT, UNIT 3. FUEL DENSIFICATION EFFECTS.
4 Jan 73, 2p

Descriptors: *Humboldt bay power reactor.

For abstract, see NSA 27 06, number 14128.

DOCKET-50133-103 PC$3.00/MF$0.95
Directorate Of Licensing (Aec), Washington, D. C.
HUMBOLDT BAY POWER PLANT, UNIT 3. LICENSE NO. DPR-7, CHANGE 42.
14 Dec 72, 4p

Descriptors: *Humboldt bay power reactor.

For abstract, see NSA 27 06, number 14129.

DOCKET-50155-134 PC$3.00/MF$0.95
Consumers Power Co., Jackson, Mich.
BIG ROCK POINT NUCLEAR PLANT. PALISADES PLANT. VALVE WALL THICKNESS.
9 Nov 72, 5p DOCKET-50255-123

Descriptors: *Big rock point power reactor, *Palisades power reactor.

For abstract, see NSA 27 06, number 14130.

DOCKET-50155-135 PC$3.00/MF$0.95
Consumers Power Co., Jackson, Mich.
BIG ROCK POINT NUCLEAR PLANT. FAILURE OF VALVE TO CLOSE ON MANUAL INITIATION.
20 Dec 72, 1p

Descriptors: *Big rock point power reactor.

For abstract, see NSA 27 06, number 14082.

DOCKET-50155-136 PC$3.00/MF$0.95
Consumers Power Co., Jackson, Mich.
BIG ROCK POINT NUCLEAR PLANT. PALISADES PLANT. INFORMATION REGARDING LIMITORQUE VALVE OPERATOR.
8 Jan 73, 1p DOCKET-50255-128

Descriptors: *Big rock point power reactor, *Palisades power reactor.

For abstract, see NSA 27 06, number 14131.

DOCKET-50171-110 PC$3.00/MF$0.95
Philadelphia Electric Co., Pa.
PEACH BOTTOM ATOMIC POWER STATION, UNIT 1. SLOW SCRAM SPEED OF CONTROL ROD ON ROUTINE TESTING.
22 Dec 72, 2p

Descriptors: *Peach bottom power reactor/ unit 1.

For abstract, see NSA 27 06, number 14083.

DOCKET-50206-178 PC$3.00/MF$0.95
Southern California Edison Co., Rosemead, Calif.
SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 1. FUEL DENSIFICATION EFFECTS.
27 Nov 72, 2p

Descriptors: *San onofre power reactor/ unit .

For abstract, see NSA 27 06, number 14132.

DOCKET-50213-171 PC$3.00/MF$0.95
Connecticut Yankee Atomic Power Co., Haddam.
HADDAM NECK PLANT, UNIT 1. OPERATION REPORT NO. 72-11 FOR THE MONTH OF NOVEMBER 1972.
26 Dec 72, 15p NYO-3144-78

Descriptors: *Connecticut yankee power reactor.

For abstract, see NSA 27 06, number 14084.

DOCKET-50213-172 PC$3.00/MF$0.95
Connecticut Yankee Atomic Power Co., Hartford.
HADDAM NECK PLANT, UNIT 1. CONTAINMENT AIR LEAKAGE.
28 Dec 72, 6p

Descriptors: *Connecticut yankee power reactor.

For abstract, see NSA 27 06, number 14085.

DOCKET-50219-225 PC$3.00/MF$0.95
Jersey Central Power And Light Co., Morristown, N. J.
OYSTER CREEK NUCLEAR POWER PLANT, UNIT 1. APPLICATION FOR FULL TERM LICENSE, SUPPLEMENT 3.
9 Jan 73, 4p

Descriptors: *Oyster creek power reactor/ unit 1.

For abstract, see NSA 27 06, number 14133.

DOCKET-50219-226 PC$3.00/MF$0.95
Jersey Central Power And Light Co., Morristown, N. J.
OYSTER CREEK NUCLEAR POWER PLANT, UNIT 1. TECHNICAL SPECIFICATIONS, CHANGE REQUEST 13.
15 Jan 73, 12p

Descriptors: *Oyster creek power reactor/ unit 1.

For abstract, see NSA 27 06, number 14086.

DOCKET-50220-118 PC$3.00/MF$0.95
Niagara Mohawk Power Corp., Syracuse, N. Y.
NINE MILE POINT NUCLEAR STATION, UNIT 1. FUEL DENSIFICATION EFFECT.
3 Jan 73, 3p

Descriptors: *Nine mile point power reactor/ unit 1.

For abstract, see NSA 27 06, number 14134.

DOCKET-50220-119 PC$3.00/MF$0.95
Niagara Mohawk Power Corp., Syracuse, N. Y.
NINE MILE POINT NUCLEAR STATION, UNIT 1. PROPOSED CHANGE, ACCESS PLATFORM TO BE ADDED.
11 Jan 73, 7p

Descriptors: *Nine mile point power reactor/ unit 1.

For abstract, see NSA 27 06, number 14135.

DOCKET-50237-288 PC$3.00/MF$0.95
Commonwealth Edison Co., Chicago, Ill.
DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3. QUAD-CITIES STATION, UNITS 1 AND 2. LA SALLE COUNTY STATION, UNITS 1 AND 2. FUEL DENSIFICATION EFFECTS.
3 Jan 73, 1p DOCKET-50249-179, DOCKET-50254-153 DOCKET-50265-142, DOCKET-50373-29

Descriptors: *Dresden power reactor/ unit 2, *Dresden power reactor/ unit 3, *La salle county power reactor/ unit 1, *La salle county power reactor/ unit 2, *Quad cities power reactor/ unit .

For abstract, see NSA 27 06, number 14087.

DOCKET-50237-289 PC$3.00/MF$0.95
Commonwealth Edison Co., Chicago, Ill.
DRESDEN NUCLEAR POWER STATION, UNIT 2. SNAP-LOCK LIMIT SWITCHES.
4 Jan 73, 1p

Descriptors: *Dresden power reactor/ unit 1.

For abstract, see NSA 27 06, number 14136.

DOCKET-50237-290 PC$3.00/MF$0.95
Commonwealth Edison Co., Chicago, Ill.
DRESDEN NUCLEAR POWER STATION, UNIT 2. MAIN STEAM ISOLATION VALVE LEAKAGE TEST- HPCI VALVE FAILED TO OPEN.
28 Dec 72, 4p

Descriptors: *Dresden power reactor/ unit 2.

For abstract, see NSA 27 06, number 14088.

DOCKET-50244-134 PC$3.00/MF$0.95
Rochester Gas And Electric Corp., N. Y.
ROBERT EMMETT GINNA NUCLEAR POWER PLANT, UNIT 1. MONTHLY REPORT OF ACTIVITY MEASUREMENTS, OCTOBER 26--NOVEMBER 25, 1972- UNPLANNED RELEASE OF RADIOACTIVE GASES, AUGUST 31-SEPTEMBER 1, 1972.
28 Dec 72, 4p

Descriptors: *Robert e. ginna power reactor/ unit .

For abstract, see NSA 27 06, number 14089.

DOCKET-50244-135 PC$3.00/MF$0.95
Rochester Gas And Electric Corp., N. Y.
ROBERT EMMETT GINNA NUCLEAR POWER PLANT, UNIT 1. PHYSICS MEASUREMENTS OF CYCLE III.
28 Dec 72, 13p

Descriptors: *Robert e. ginna power reactor/ unit .

For abstract, see NSA 27 06, number 14090.

DOCKET-50245-179 PC$3.00/MF$0.95
Millstone Point Co., Hartford, Conn.
MILLSTONE POINT NUCLEAR POWER STATION, UNIT 1. ANALYSIS OF RELIEF VALVE DISCHARGE PIPING AND MAIN SAFETY VALVE PIPING.
20 Nov 72, 162p

Descriptors: *Millstone point power reactor/ unit 1.

For abstract, see NSA 27 06, number 14137.

DOCKET-50245-180 PC$3.00/MF$0.95
Millstone Point Co., Hartford, Conn.
MILLSTONE POINT NUCLEAR POWER STATION, UNIT 1. CHLORIDE INTRUSION INCIDENT, SPECIFIC DISCUSSION ITEMS.
26 Dec 72, 8p

Descriptors: *Millstone point power reactor/ unit 1.

For abstract, see NSA 27 06, number 14091.

DOCKET-50245-181 PC$3.00/MF$0.95
Millstone Point Co., Hartford, Conn.
MILLSTONE POINT NUCLEAR POWER STATION, UNIT 1. TECHNICAL SPECIFICATIONS, PROPOSED CHANGE.
5 Jan 73, 9p

Descriptors: *Millstone point power reactor/ unit 1.

For abstract, see NSA 27 06, number 14092.

DOCKET-50245-182 PC$3.00/MF$0.95
Millstone Point Co., Hartford, Conn.
MILLSTONE POINT NUCLEAR POWER STATION, UNIT 1. CHLORIDE INTRUSION INCIDENT, REVISIONS.
12 Jan 73, 66p

Descriptors: *Millstone point power reactor/ unit 1.

For abstract, see NSA 27 06, number 14138.

DOCKET-50245-183 PC$3.00/MF$0.95
Millstone Point Co., Hartford, Conn.
MILLSTONE POINT NUCLEAR POWER STATION, UNIT 1. FUEL DENSIFICATION EFFECT.
29 Dec 72, 1p

Descriptors: *Millstone point power reactor/ unit 1.

For abstract, see NSA 27 06, number 14139.

DOCKET-50247-88 PC$3.00/MF$0.95
Consolidated Edison Co. Of New York, Inc., New York.
INDIAN POINT NUCLEAR GENERATING UNIT 2. POTENTIAL ADVERSE EFFECTS ON SAFETY RELATED EQUIPMENT CAUSED BY FAILURE OF NON-SEISMICALLY DESIGNED EQUIPMENT.
18 Dec 72, 4p

Descriptors: *Indian point power reactor/ unit 2.

For abstract, see NSA 27 06, number 14140.

DOCKET-50247-89 PC$3.00/MF$0.95
Directorate Of Licensing (Aec), Washington, D. C.
INDIAN POINT NUCLEAR GENERATING UNIT 2. ORDER EXTENDING COMPLETION DATE TO MARCH 1, 1973.
27 Dec 72, 3p

Descriptors: *Indian point power reactor/ unit 2.

For abstract, see NSA 27 06, number 14141.

DOCKET-50250-108 PC$3.00/MF$0.95
Florida Power And Light Co.
TURKEY POINT PLANT, UNITS 3 AND 4. DESIGN DEFICIENCY IN INSTRUMENT POWER SYSTEM.
11 Dec 72, 5p DOCKET-50251-88

Descriptors: *Turkey point power reactor/ unit .

For abstract, see NSA 27 06, number 14093.

DOCKET-50250-109 PC$3.00/MF$0.95
Florida Power And Light Co.
TURKEY POINT PLANT, UNIT 3. BATTERY CHARGER FIRE.
22 Dec 72, 2p

Descriptors: *Turkey point power reactor/ unit .

For abstract, see NSA 27 06, number 14094.

DOCKET-50250-110 PC$3.00/MF$0.95
Florida Power And Light Co.
TURKEY POINT PLANT, UNITS 3 AND 4. FIRE MAIN RISER FOUND IN SWITCHGEAR ROOM IS BEING REROUTED.
5 Jan 73, 1p DOCKET-50251-91

Descriptors: *Turkey point power reactor/ unit .

For abstract, see NSA 27 06, number 14142.

DOCKET-50254-156 PC$3.00/MF$0.95
Commonwealth Edison Co., Cordova, Ill.
QUAD-CITIES STATION, UNITS 1 AND 2. IMPROPER VALVE LINE-UP RESULTED IN LOSS OF FLOW TO MAIN CHIMNEY SAMPLE SYSTEM.
22 Dec 72, 3p DOCKET-50265-146

Descriptors: *Quad cities power reactor/ unit .

For abstract, see NSA 27 06, number 14095.

DOCKET-50254-157 PC$3.00/MF$0.95
Commonwealth Edison Co., Cordova, Ill.
QUAD-CITIES STATION, UNITS 1 AND 2. SETPOINT DRIFT OF AN EHC OIL PRESSURE SWITCH. LOSS OF FLOW TO MAIN CHIMNEY SAMPLE SYSTEM.
11 Jan 73, 4p DOCKET-50265-148

Descriptors: *Quad cities power reactor/ unit .

For abstract, see NSA 27 06, number 14096.

DOCKET-50255-129 PC$3.00/MF$0.95
Consumers Power Co., Jackson, Mich.
PALISADES PLANT. STEPS TAKEN TO CORRECT ITEM OF NONCOMPLIANCE BROUGHT TO ATTENTION IN LETTER DATED NOVEMBER 17, 1972.
15 Dec 72, 20p

Descriptors: *Palisades power reactor.

For abstract, see NSA 27 06, number 14143.

DOCKET-50259-73 PC$3.00/MF$0.95
Directorate Of Licensing (Aec), Washington, D. C.
BROWNS FERRY NUCLEAR POWER STATION, UNITS 1, 2, AND 3. SAFETY EVALUATION, SUPPLEMENT 1.
21 Dec 72, 69p DOCKET-50260-69, DOCKET-50296-67

Descriptors: *Browns ferry power reactor/ unit 1, *Browns ferry power reactor/ unit 2, *Browns ferry power reactor/ unit 3.

For abstract, see NSA 27 06, number 14144.

DOCKET-50261-133 PC$3.00/MF$0.95
Carolina Power And Light Co., Raleigh, N. C.
H. B. ROBINSON UNIT 2. TECHNICAL SPECIFICATION CHANGE FOR TEST FUEL ASSEMBLIES.
5 Jan 73, 15p

Descriptors: *H.b. robinson power reactor/ unit 2.

For abstract, see NSA 27 06, number 14145.

DOCKET-50261-134 PC$3.00/MF$0.95
Carolina Power And Light Co., Raleigh, N. C.
H. B. ROBINSON UNIT 2. MONTHLY REPORT OF PRIMARY AND SECONDARY ACTIVITY MEASUREMENTS AND EFFLUENT DISCHARGE ACTIVITY LEVELS FOR NOVEMBER 1972.
3 Jan 73, 2p

Descriptors: *H.b. robinson power reactor/ unit 2.

For abstract, see NSA 27 06, number 14097.

DOCKET-50261-135 PC$3.00/MF$0.95
Carolina Power And Light Co., Raleigh, N. C.
H. B. ROBINSON UNIT 2. RESPONSE TO NON-COMPLIANCE REPORT OF NOVEMBER 10, 1972.
30 Nov 72, 7p

Descriptors: *H.b. robinson power reactor/ unit 2.

For abstract, see NSA 27 06, number 14098.

DOCKET-50261-136 PC$3.00/MF$0.95
Carolina Power And Light Co., Raleigh, N. C.
H. B. ROBINSON UNIT 2. ENVIRONMENTAL REPORT, SUPPLEMENT 1.
15 Jan 73, 137p

Descriptors: *Environment, *H.b. robinson power reactor/ unit 2.

For abstract, see NSA 27 06, number 14146.

DOCKET-50263-166 PC$3.00/MF$0.95
Northern States Power Co., Minneapolis, Minn.
MONTICELLO NUCLEAR GENERATING PLANT, UNIT 1. PROVISIONAL OPERATING LICENSE NO. DPR-22, APPLICATION FOR AMENDMENT 2, SUPPLEMENT 1.
21 Dec 72, 5p

Descriptors: *Monticello power reactor/ unit 1.

For abstract, see NSA 27 06, number 14099.

DOCKET-50263-167 PC$3.00/MF$0.95
Directorate Of Licensing (Aec), Washington, D. C.
MONTICELLO NUCLEAR GENERATING PLANT, UNIT 1. TECHNICAL SPECIFICATIONS, CHANGE 4.
8 Dec 72, 2p

Descriptors: *Monticello power reactor/ unit 1.

For abstract, see NSA 27 06, number 14147.

DOCKET-50263-168 PC$3.00/MF$0.95
Northern States Power Co., Minneapolis, Minn.
MONTICELLO NUCLEAR GENERATING PLANT, UNIT 1. RHR PUMP MOTOR FAILURE- REPORTING OF TORUS-TO--DRYWELL VACUUM BREAKER PROBLEMS- MAIN STEAM ISOLATION VALVE PERFORMANCE- PERFORMANCE OF THE REACTOR COOLANT LEAKAGE DETECTION SYSTEM.
28 Dec 72, 15p

Descriptors: *Monticello power reactor/ unit 1.

For abstract, see NSA 27 06, number 14100.

DOCKET-50263-169 PC$3.00/MF$0.95
Northern States Power Co., Minneapolis, Minn.
MONTICELLO NUCLEAR GENERATING PLANT, UNIT 1. FUEL DENSIFICATION EFFECTS.
29 Dec 72, 8p

Descriptors: *Monticello power reactor/ unit 1.

For abstract, see NSA 27 06, number 14148.

DOCKET-50263-170 PC$3.00/MF$0.95
Northern States Power Co., Minneapolis, Minn.
MONTICELLO NUCLEAR GENERATING PLANT, UNIT 1. STEPS TAKEN TO CORRECT ITEMS OF NONCOMPLIANCE BROUGHT TO ATTENTION IN LETTER DATED OCTOBER 19, 1972.
18 Dec 72, 28p

Descriptors: *Monticello power reactor/ unit 1.

For abstract, see NSA 27 06, number 14149.

DOCKET-50263-171 PC$3.00/MF$0.95
Northern States Power Co., Minneapolis, Minn.
MONTICELLO NUCLEAR GENERATING PLANT, UNIT 1. SUPPORT HANGERS FOR EMERGENCY CORE COOLING SYSTEM SUCTION HEADER.
6 Dec 72, 2p

Descriptors: *Monticello power reactor/ unit 1.

For abstract, see NSA 27 06, number 14150.

DOCKET-50263-172 PC$3.00/MF$0.95
Northern States Power Co., Minneapolis, Minn.
MONTICELLO NUCLEAR GENERATING PLANT, UNIT 1. RHR SERVICE WATER PUMP SEAL PROBLEM. INFORMATION RELATING TO TORUS RING HEADER SUPPORTS.
11 Jan 73, 3p

Descriptors: *Monticello power reactor/ unit 1.

For abstract, see NSA 27 06, number 14101.

DOCKET-50265-144 PC$3.00/MF$0.95
Commonwealth Edison Co., Cordova, Ill.
QUAD-CITIES STATION, UNIT 2. DRIFT OF REACTOR PROTECTION SYSTEM SCRAM INSTRUMENTS.
27 Dec 72, 2p

Descriptors: *Quad cities power reactor/ unit .

For abstract, see NSA 27 06, number 14102.

DOCKET-50265-145 PC$3.00/MF$0.95
Commonwealth Edison Co., Cordova, Ill.
QUAD-CITIES STATION, UNIT 2. MAIN STEAM ISOLATION VALVE CLOSURE TIME IN EXCESS OF TECHNICAL SPECIFICATION LIMITS.
3 Jan 73, 3p

Descriptors: *Quad cities power reactor/ unit .

For abstract, see NSA 27 06, number 14103.

DOCKET-50265-147 PC$3.00/MF$0.95
Commonwealth Edison Co., Cordova, Ill.
QUAD-CITIES STATION, UNIT 2. CLEANUP OUTBOARD ISOLATION VALVE FAILED TO CLOSE DECEMBER 24, 1972.
5 Jan 73, 4p

Descriptors: *Quad cities power reactor/ unit .

For abstract, see NSA 27 06, number 14104.

DOCKET-50265-149 PC$3.00/MF$0.95
Commonwealth Edison Co., Cordova, Ill.
QUAD-CITIES STATION, UNIT 2. HIGH LEVEL IN UNIT 2 SUPPRESSION CHAMBER. ABNORMALITY IN THE SODIUM PENTABORATE SOLUTION LEVEL.
9 Jan 73, 6p

Descriptors: *Quad cities power reactor/ unit .

For abstract, see NSA 27 06, number 14105.

DOCKET-50266-94 PC$3.00/MF$0.95
Wisconsin Electric Power Co., Milwaukee.

POINT BEACH NUCLEAR PLANT, UNIT 1. SUSPECTED EXPOSURE OF FIVE TO SIX REM TO EMPLOYEE OCTOBER 5, 1972.
6 Oct 72, 1p

Descriptors: *Point beach power reactor/ unit .

For abstract, see NSA 27 06, number 14106.

DOCKET-50266-95 PC$3.00/MF$0.95
Wisconsin Electric Power Co., Milwaukee.
POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2. COMMENTS ON SIMULTANEOUS ACTUATION OF A SAFETY INJECTION SIGNAL ON BOTH UNITS OF A DUAL UNIT FACILITY.
11 Dec 72, 4p DOCKET-50301-80

Descriptors: *Point beach power reactor/ unit .

For abstract, see NSA 27 06, number 14151.

DOCKET-50269-84 PC$3.00/MF$0.95
Duke Power Co., Charlotte, N. C.
OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3. INSTALLATION OF FLOW RESTRICTORS IN CORE FLOODING NOZZLES.
12 Jan 73, 66p DOCKET-50270-70, DOCKET-50287-62

Descriptors: *Oconee power reactor/ unit 1, *Oconee power reactor/ unit 2, *Oconee power reactor/ unit 3.

For abstract, see NSA 27 06, number 14152.

DOCKET-50271-126 PC$3.00/MF$0.95
Vermont Yankee Nuclear Power Corp., Rutland.
VERMONT YANKEE NUCLEAR POWER STATION. FUEL DENSIFICATION EFFECTS.
3 Jan 73, 1p

Descriptors: *Vermont yankee power reactor.

For abstract, see NSA 27 06, number 14153.

DOCKET-50271-127 PC$3.00/MF$0.95
Vermont Yankee Nuclear Power Corp., Rutland.
VERMONT YANKEE NUCLEAR POWER STATION. OPERATIONS REPORT NO. 72-9 FOR MONTH OF SEPTEMBER 1972.
2 Jan 73, 32p

Descriptors: *Vermont yankee power reactor.

For abstract, see NSA 27 06, number 14107.

DOCKET-50271-128 PC$3.00/MF$0.95
Vermont Yankee Nuclear Power Corp., Rutland.
VERMONT YANKEE NUCLEAR POWER STATION. RELEASE OF SHORT-LIVED RADIOACTIVE GAS, DECEMBER 12, 1972- NO. 1 FAN ON WEST COOLING TOWER TRIPPED, DECEMBER 20, 1972- GASKET ON PUMP GLAND SEAL EXHAUST CONDENSER FAILED, DECEMBER 22, 1972- HPCI STEAMLINE HIGH DIFFERENTIAL PRESSURE SWITCH RESET, DECEMBER 19, 1972.
28 Dec 72, 9p

Descriptors: *Vermont yankee power reactor.

For abstract, see NSA 27 06, number 14108.

DOCKET-50271-129 PC$3.00/MF$0.95
Directorate Of Licensing (Aec), Washington, D. C.
VERMONT YANKEE NUCLEAR POWER STATION. TECHNICAL SPECIFICATIONS, CHANGE 5.
3 Jan 73, 5p

Descriptors: *Vermont yankee power reactor.

For abstract, see NSA 27 06, number 14109.

DOCKET-50271-131 PC$3.00/MF$0.95
Vermont Yankee Nuclear Power Corp., Rutland.
VERMONT YANKEE NUCLEAR POWER STATION. ACTION TAKEN TO CORRECT ITEMS OF NONCOMPLIANCE BROUGHT TO ATTENTION FOLLOWING INSPECTION ON SEPTEMBER 13-15, AND 26, 1972.
6 Nov 72, 18p

Descriptors: *Vermont yankee power reactor.

For abstract, see NSA 27 06, number 14110.

DOCKET-50271-132 PC$3.00/MF$0.95
Vermont Yankee Nuclear Power Corp., Rutland.
VERMONT YANKEE NUCLEAR POWER STATION. HPCI INVERTER TRIPPED.
3 Jan 73, 2p

Descriptors: *Vermont yankee power reactor.

For abstract, see NSA 27 06, number 14111.

DOCKET-50271-133 PC$3.00/MF$0.95
Directorate Of Licensing (Aec), Washington, D. C.
VERMONT YANKEE NUCLEAR POWER STATION. TECHNICAL SPECIFICATIONS, CHANGE 4.
10 Jan 73, 6p

Descriptors: *Vermont yankee power reactor.

For abstract, see NSA 27 06, number 14154.

DOCKET-50271-134 PC$3.00/MF$0.95
Directorate Of Licensing (Aec), Washington, D. C.
VERMONT YANKEE NUCLEAR POWER STATION. FACILITY OPERATING LICENSE DPR--28, AMENDMENT 4.
8 Jan 73, 4p

Descriptors: *Vermont yankee power reactor.

For abstract, see NSA 27 06, number 14155.

DOCKET-50272-46 PC$3.00/MF$0.95
Public Service Electric And Gas Co., Newark, N. J.
SALEM NUCLEAR GENERATING STATION, UNITS 1 AND 2. FINAL SAFETY ANALYSIS REPORT, AMENDMENT 17.
18 Dec 72, 98p DOCKET-50311-47

Descriptors: *Salem power reactor/ unit .

For abstract, see NSA 27 06, number 14156.

DOCKET-50275-29 PC$3.00/MF$0.95
Pacific Gas And Electric Co., San Francisco, Calif.
DIABLO CANYON NUCLEAR POWER PLANT, UNITS 1 AND 2. DESIGN DEFICIENCY IN CONCRETE WALLS.
20 Nov 72, 3p DOCKET-50323-27

Descriptors: *Diablo canyon power reactor/ unit 1, *Diablo canyon power reactor/ unit 2.

For abstract, see NSA 27 06, number 14157.

DOCKET-50275-30 PC$3.00/MF$0.95
Pacific Gas And Electric Co., San Francisco, Calif.
DIABLO CANYON NUCLEAR POWER PLANT, UNITS 1 AND 2. FUEL DENSIFICATION EFFECT.
3 Jan 73, 2p DOCKET-50323-28

Descriptors: *Diablo canyon power reactor/ unit 1, *Diablo canyon power reactor/ unit 2.

For abstract, see NSA 27 06, number 14158.

DOCKET-50277-71 PC$3.00/MF$0.95
Philadelphia Electric Co., Pa.
PEACH BOTTOM ATOMIC POWER STATION, UNIT 2. SIGNIFICANT DEFICIENCY INTERIM REPORT CONCERNING MAIN STEAM LINE RESTRAINTS.
7 Dec 72, 3p

Descriptors: *Peach bottom power reactor/ unit 2.

For abstract, see NSA 27 06, number 14159.

DOCKET-50277-72 PC$3.00/MF$0.95
Philadelphia Electric Co., Pa.
PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3. RADIOACTIVE EFFLUENT LIMITS.
4 Jan 73, 3p DOCKET-50278-70

Descriptors: *Peach bottom power reactor/ unit 2, *Peach bottom power reactor/ unit 3.

For abstract, see NSA 27 06, number 14160.

DOCKET-50277-73 PC$3.00/MF$0.95
Philadelphia Electric Co., Pa.
PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3. FUEL DENSIFICATION EFFECT.
3 Jan 73, 1p DOCKET-50278-71

Descriptors: *Peach bottom power reactor/ unit 2, *Peach bottom power reactor/ unit 3.

For abstract, see NSA 27 06, number 14161.

DOCKET-50280-100 PC$3.00/MF$0.95
Virginia Electric And Power Co., Richmond.
SURRY POWER STATION, UNITS 1 AND 2. TECHNICAL SPECIFICATIONS, REVISION NO. 4, RECOMMENDED CHANGES.
29 Dec 72, 13p DOCKET-50281-80

Descriptors: *Surry power reactor/ unit .

For abstract, see NSA 27 06, number 14163.

DOCKET-50280-101 PC$3.00/MF$0.95
Virginia Electric And Power Co., Richmond.
SURRY POWER STATION, UNITS 1 AND 2. HYDROGEN RECOMBINER INSTALLED ON UNIT 1 AND RECOMBINER FOR UNIT 2 BEING PREPARED FOR TESTING.
5 Jan 73, 1p DOCKET-50281-81

Descriptors: *Surry power reactor/ unit .

For abstract, see NSA 27 06, number 14112.

DOCKET-50280-99 PC$3.00/MF$0.95
Virginia Electric And Power Co., Richmond.
SURRY POWER STATION, UNIT 1. REQUEST REVIEW OF FUEL DENSIFICATION REPORT BE EXPEDITED.
21 Dec 72, 3p

Descriptors: *Surry power reactor/ unit .

For abstract, see NSA 27 06, number 14162.

DOCKET-50282-85 PC$3.00/MF$0.95
Northern States Power Co., Minneapolis, Minn.
PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2. REQUEST FOR EXTENSION OF LATEST DATES OF COMPLETION.
28 Dec 72, 3p DOCKET-50306-81

Descriptors: *Prairie island power reactor/ unit .

For abstract, see NSA 27 06, number 14164.

DOCKET-50282-86 PC$3.00/MF$0.95
Northern States Power Co., Minneapolis, Minn.

PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2. LIMITORQUE VALVE OPERATOR FAILURES.
20 Dec 72, 2p DOCKET-50306-82

Descriptors: *Prairie island power reactor/ unit .

For abstract, see NSA 27 06, number 14113.

DOCKET-50282-87 PC$3.00/MF$0.95
Northern States Power Co., Minneapolis, Minn.
PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2. FINAL SAFETY ANALYSIS REPORT, AMENDMENT 27.
20 Dec 72, 111p DOCKET-50306-83

Descriptors: *Prairie island power reactor/ unit .

For abstract, see NSA 27 06, number 14165.

DOCKET-50285-79 PC$3.00/MF$0.95
Omaha Public Power District, Nebr.
FORT CALHOUN STATION, UNIT 1. FAILURE OF NON-CATEGORY I (SEISMIC) EQUIPMENT EFFECT ON OTHER SAFETY RELATED EQUIPMENT.
19 Oct 72, 2p

Descriptors: *Fort calhoun power reactor/ unit 1.

For abstract, see NSA 27 06, number 14166.

DOCKET-50285-80 PC$3.00/MF$0.95
Directorate Of Licensing (Aec), Washington, D. C.
FORT CALHOUN STATION, UNIT 1. ORDER EXTENDING COMPLETION DATE TO JUNE 31, 1973.
27 Dec 72, 3p

Descriptors: *Fort calhoun power reactor/ unit 1.

For abstract, see NSA 27 06, number 14167.

DOCKET-50285-81 PC$3.00/MF$0.95
Omaha Public Power District, Nebr.
FORT CALHOUN STATION, UNIT 1. LIMITORQUE OPERATORS.
12 Jan 73, 6p

Descriptors: *Fort calhoun power reactor/ unit 1.

For abstract, see NSA 27 06, number 14114.

DOCKET-50285-82 PC$3.00/MF$0.95
Omaha Public Power District, Nebr.
FORT CALHOUN STATION, UNIT 1. INSPECTIONS OF NOVEMBER 3, 1972 AND NOVEMBER 20, 1972.
24 Nov 72, 39p

Descriptors: *Fort calhoun power reactor/ unit 1.

For abstract, see NSA 27 06, number 14168.

DOCKET-50286-57 PC$6.00/MF$0.95
Consolidated Edison Co. Of New York, Inc., New York.
INDIAN POINT NUCLEAR GENERATING UNIT 3. FINAL FACILITY DESCRIPTION AND SAFETY ANALYSIS REPORT, SUPPLEMENT 9.
12 Jan 73, 358p

Descriptors: *Indian point power reactor/ unit 3.

For abstract, see NSA 27 06, number 14169.

DOCKET-50286-58 PC$3.00/MF$0.95
Consolidated Edison Co. Of New York, Inc., New York.
INDIAN POINT NUCLEAR GENERATING UNIT 3. ACTION TO BE TAKEN TO CORRECT ITEM OF NONCOMPLIANCE BROUGHT TO ATTENTION FOLLOWING INSPECTION ON OCTOBER 26, 1972.
29 Nov 72, 11p

Descriptors: *Indian point power reactor/ unit 3.

For abstract, see NSA 27 06, number 14170.

DOCKET-50286-59 PC$3.00/MF$0.95
Consolidated Edison Co. Of New York, Inc., New York.
INDIAN POINT NUCLEAR GENERATING UNIT 3. FUEL DENSIFICATION EFFECTS.
9 Jan 73, 2p

Descriptors: *Indian point power reactor/ unit 3.

For abstract, see NSA 27 06, number 14171.

DOCKET-50286-60 PC$3.00/MF$0.95
Oak Ridge National Lab., Tenn.
INDIAN POINT NUCLEAR GENERATING UNIT 3. REINSPECTION AND APPRAISAL OF THE INDIAN POINT NO. 3 REACTOR PRESSURE VESSEL SUBSEQUENT TO HOIST FAILURE ON JANUARY 12, 1971.
Oct 72, 66p
For Consolidated Edison Co. Of New York, Inc., New York.

Descriptors: *Indian point power reactor/ unit 3.

For abstract, see NSA 27 06, number 14172.

DOCKET-50289-83 PC$3.00/MF$0.95
Metropolitan Edison Co., Reading, Pa.
THREE MILE ISLAND NUCLEAR STATION, UNITS 1 AND 2. QUALITY ASSURANCE PROGRAM.
14 Dec 72, 38p DOCKET-50320-39

Descriptors: *Three mile island power reactor/ unit .

For abstract, see NSA 27 06, number 14173.

DOCKET-50289-84 PC$3.00/MF$0.95
Metropolitan Edison Co., Reading, Pa.
THREE MILE ISLAND NUCLEAR STATION, UNIT 1. ERRORS IN INSPECTION REPORT.
4 Dec 72, 16p

Descriptors: *Three mile island power reactor/ unit .

For abstract, see NSA 27 06, number 14174.

DOCKET-50289-85 PC$3.00/MF$0.95
Metropolitan Edison Co., Reading, Pa.
THREE MILE ISLAND NUCLEAR STATION, UNIT 1. DEFECTS IN SHOP WELDS OF COOLANT PIPING.
8 Dec 72, 4p

Descriptors: *Three mile island power reactor/ unit .

For abstract, see NSA 27 06, number 14175.

DOCKET-50289-86 PC$3.00/MF$0.95
Metropolitan Edison Co., Reading, Pa.
THREE MILE ISLAND NUCLEAR STATION, UNIT 1. ACTION TO BE TAKEN TO CORRECT ITEMS OF NONCOMPLIANCE BROUGHT TO ATTENTION FOLLOWING INSPECTION OF OCTOBER 20, 1972.
20 Nov 72, 17p

Descriptors: *Three mile island power reactor/ unit .

For abstract, see NSA 27 06, number 14176.

DOCKET-50289-87 PC$3.00/MF$0.95
Metropolitan Edison Co., Reading, Pa.
THREE MILE ISLAND NUCLEAR STATION, UNITS 1 AND 2. ACTION TAKEN TO CORRECT ITEM OF NONCOMPLIANCE WHICH WAS BROUGHT TO ATTENTION FOLLOWING INSPECTION OF SEPTEMBER 25-27, 1972.
1 Dec 72, 14p DOCKET-50320-40

Descriptors: *Three mile island power reactor/ unit .

For abstract, see NSA 27 06, number 14177.

DOCKET-50293-109 PC$3.00/MF$0.95
Boston Edison Co., Mass.
PILGRIM NUCLEAR POWER STATION. ACTION TAKEN TO CORRECT ITEMS OF NONCOMPLIANCE BROUGHT TO ATTENTION FOLLOWING INSPECTION OF SEPTEMBER 27-29, 1972 AND OCTOBER 10-12, 1972.
22 Nov 72, 25p

Descriptors: *Pilgrim power reactor.

For abstract, see NSA 27 06, number 14115.

DOCKET-50293-110 PC$3.00/MF$0.95
Boston Edison Co., Mass.
PILGRIM NUCLEAR POWER STATION. DRIFT OF SETPOINTS ON PRESSURE SWITCHES, DECEMBER 22, 1972 AND DECEMBER 23, 1972- LOSS OF TURBINE OIL PRESSURE, DECEMBER 30, 1972.
31 Dec 72, 3p

Descriptors: *Pilgrim power reactor.

For abstract, see NSA 27 06, number 14116.

DOCKET-50295-76 PC$3.00/MF$0.95
Commonwealth Edison Co., Chicago, Ill.
ZION STATION NUCLEAR POWER PLANT, UNITS 1 AND 2. STEPS TAKEN TO CORRECT ITEMS OF NONCOMPLIANCE BROUGHT TO ATTENTION IN LETTER OF OCTOBER 16, 1972.
15 Nov 72, 41p DOCKET-50304-73

Descriptors: *Zion power reactor/ unit .

For abstract, see NSA 27 06, number 14178.

DOCKET-50298-61 PC$3.00/MF$0.95
Nebraska Public Power District, Columbus.
COOPER NUCLEAR STATION. FUEL DENSIFICATION EFFECT.
28 Dec 72, 1p

Descriptors: *Cooper power reactor.

For abstract, see NSA 27 06, number 14179.

DOCKET-50301-79 PC$3.00/MF$0.95
Wisconsin Electric Power Co., Milwaukee.
POINT BEACH NUCLEAR PLANT, UNIT 2. FUEL DENSIFICATION EFFECT.
3 Jan 73, 2p

Descriptors: *Point beach power reactor/ unit .

For abstract, see NSA 27 06, number 14180.

DOCKET-50302-60 PC$3.00/MF$0.95
Florida Power Corp., St. Petersburg.
CRYSTAL RIVER NUCLEAR GENERATING PLANT, UNIT 3. FINAL SAFETY ANALYSIS REPORT, AMENDMENT 23.
27 Dec 72, 155p

Descriptors: *Crystal river power reactor/ unit 3.

For abstract, see NSA 27 06, number 14181.

DOCKET-50305-62 PC$3.00/MF$0.95
Directorate Of Licensing (Aec), Washington, D. C.
KEWAUNEE NUCLEAR POWER PLANT. SAFETY EVALUATION, SUPPLEMENT 1.
18 Dec 72, 23p

Descriptors: *Kewaunee power reactor.

For abstract, see NSA 27 06, number 14182.

DOCKET-50305-63 PC$3.00/MF$0.95
Directorate Of Licensing (Aec), Washington, D. C.
KEWAUNEE NUCLEAR POWER PLANT. ORDER EXTENDING CONSTRUCTION COMPLETION DATE TO AUGUST 31, 1973.
27 Dec 72, 3p

Descriptors: *Kewaunee power reactor.

For abstract, see NSA 27 06, number 14183.

DOCKET-50305-64 PC$3.00/MF$0.95
Wisconsin Public Service Corp., Green Bay.
KEWAUNEE NUCLEAR POWER PLANT. FUEL DENSIFICATION EFFECT.
29 Dec 72, 2p

Descriptors: *Kewaunee power reactor.

For abstract, see NSA 27 06, number 14184.

DOCKET-50309-65 PC$3.00/MF$0.95
Maine Yankee Atomic Power Co., Westboro, Mass.
MAINE YANKEE ATOMIC POWER STATION. MONTHLY REPORT 10-72, OCTOBER 1972.
28 Dec 72, 25p

Descriptors: *Maine yankee power reactor.

For abstract, see NSA 27 06, number 14117.

DOCKET-50313-61 PC$3.00/MF$0.95
Arkansas Power And Light Co., Little Rock.
ARKANSAS NUCLEAR ONE, UNIT 1. STEPS TAKEN TO CORRECT ITEMS OF NONCOMPLIANCE BROUGHT TO ATTENTION IN LETTER OF OCTOBER 19, 1972.
15 Dec 72, 11p

Descriptors: *Arkansas nuclear one power reactor.

For abstract, see NSA 27 06, number 14185.

DOCKET-50315-93 PC$3.00/MF$0.95
American Electric Power Service Corp., New York.
DONALD C. COOK NUCLEAR PLANT, UNITS 1 AND 2. REPORT OF INVESTIGATION INTO TUBE FAILURE AND CORRECTIVE ACTION TAKEN.
22 Dec 72, 10p DOCKET-50316-93

Descriptors: *Donald c. cook power reactor/ unit 1, *Donald c. cook power reactor/ unit 2.

For abstract, see NSA 27 06, number 14186.

DOCKET-50317-76 PC$3.00/MF$0.95
Baltimore Gas And Electric Co., Md.
CALVERT CLIFFS NUCLEAR POWER PLANT, UNITS 1 AND 2. FINAL SAFETY ANALYSIS REPORT, AMENDMENT 32.
5 Jan 97, 34p DOCKET-50318-73

Descriptors: *Calvert cliffs power reactor/ unit 1, *Calvert cliffs power reactor/ unit 2.

For abstract, see NSA 27 06, number 14187.

DOCKET-50321-64 PC$3.00/MF$0.95
Georgia Power Co., Atlanta.
EDWIN I. HATCH NUCLEAR PLANT, UNIT 1. REACTOR VESSEL REPAIR, ADDITIONAL INFORMATION.
21 Dec 72, 6p

Descriptors: *Edwin i. hatch power reactor/ unit 1.

For abstract, see NSA 27 06, number 14188.

DOCKET-50331-71 PC$3.00/MF$0.95
Iowa Electric Light And Power Co., Cedar Rapids.
DUANE ARNOLD ENERGY CENTER. MAIN STEAM LINE SURFACE DEFECT.
5 Dec 72, 3p

Descriptors: *Duane arnold power reactor.

For abstract, see NSA 27 06, number 14189.

DOCKET-50331-72 PC$3.00/MF$0.95
Iowa Electric Light And Power Co., Cedar Rapids.
DUANE ARNOLD ENERGY CENTER. APPLICATION FOR LICENSES, AMENDMENT 10-A.
26 Dec 72, 177p

Descriptors: *Duane arnold power reactor.

For abstract, see NSA 27 06, number 14118.

DOCKET-50333-74 PC$3.00/MF$0.95
Power Authority Of The State Of New York.
JAMES A. FITZPATRICK NUCLEAR POWER PLANT. FUEL DENSIFICATION EFFECTS.
2 Jan 73, 1p

Descriptors: *James a. fitzpatrick power reactor.

For abstract, see NSA 27 06, number 14190.

DOCKET-50336-48 PC$3.00/MF$0.95
Millstone Point Co., Hartford, Conn.
MILLSTONE POINT NUCLEAR POWER STATION, UNIT 2. REACTOR COOLANT BOUNDARY VALVES 1-1/4" AND LARGER.
27 Dec 72, 3p

Descriptors: *Millstone point power reactor/ unit 2.

For abstract, see NSA 27 06, number 14191.

DOCKET-50344-35 PC$3.00/MF$0.95
Portland General Electric Co., Oreg.
TROJAN NUCLEAR PLANT. FUEL DENSIFICATION EFFECT.
27 Dec 72, 2p

Descriptors: *Trojan power reactor/ unit .

For abstract, see NSA 27 06, number 14192.

DOCKET-50344-36 PC$6.00/MF$0.95
Directorate Of Licensing (Aec), Washington, D. C.
TROJAN NUCLEAR PLANT. DRAFT ENVIRONMENTAL STATEMENT.
Jan 73, 301p

Descriptors: *Environment, *Trojan power reactor/ unit .

For abstract, see NSA 27 06, number 14193.

DOCKET-50363-43 PC$3.00/MF$0.95
Jersey Central Power And Light Co., Morristown, N. J.
FORKED RIVER NUCLEAR GENERATING STATION, UNIT 1. FUEL DENSIFICATION EFFECT.
3 Jan 73, 6p

Descriptors: *Forked river power reactor/ unit 1.

For abstract, see NSA 27 06, number 14194.

DOCKET-50366-35 PC$3.00/MF$0.95
Directorate Of Licensing (Aec), Washington, D. C.
EDWIN I. HATCH NUCLEAR PLANT, UNIT 2. CONSTRUCTION PERMIT NO. CPPR-90.
27 Dec 72, 5p

Descriptors: *Edwin i. hatch power reactor/ unit 2.

For abstract, see NSA 27 06, number 14195.

DOCKET-50369-33 PC$3.00/MF$0.95
Duke Power Co., Charlotte, N. C.
MCGUIRE NUCLEAR STATION, UNITS 1 AND 2. CATAWBA NUCLEAR STATION, UNITS 1 AND 2. FUEL DENSIFICATION EFFECTS.
3 Jan 73, 2p DOCKET-50370-33, DOCKET-50413-8 DOCKET-50414-8

Descriptors: *Catawba power reactor/ unit 1, *Catawba power reactor/ unit 2, *Mc guire power reactor/ unit 1, *Mc guire power reactor/ unit 2.

For abstract, see NSA 27 06, number 14196.

DOCKET-50369-34 PC$3.00/MF$0.95
Duke Power Co., Charlotte, N. C.
MCGUIRE NUCLEAR STATION, UNITS 1 AND 2. PRELIMINARY SAFETY ANALYSIS REPORT, REVISION 11.
28 Dec 72, 4p DOCKET-50370-34

Descriptors: *Mc guire power reactor/ unit 1, *Mc guire power reactor/ unit 2.

For abstract, see NSA 27 06, number 14197.

DOCKET-50373-30 PC$3.00/MF$0.95
Department Of Justice, Washington, D. C. Antitrust Div.
LA SALLE COUNTY STATION, UNITS 1 AND 2. NO NEED FOR AN ANTITRUST HEARING.
20 Dec 72, 21p DOCKET-50374-29

Descriptors: *La salle county power reactor/ unit 1, *La salle county power reactor/ unit 2.

For abstract, see NSA 27 06, number 14198.

DOCKET-50373-31 PC$3.00/MF$0.95
Commonwealth Edison Co., Chicago, Ill.
LA SALLE COUNTY STATION, UNITS 1 AND 2. RELEASE OF INFORMATION ON LAKE SANGCHRIS, ILL.
3 Jan 72, 2p DOCKET-50374-30

Descriptors: *La salle county power reactor/ unit 1, *La salle county power reactor/ unit 2.

For abstract, see NSA 27 06, number 14199.

DOCKET-50376-36 PC$3.00/MF$0.95
Puerto Rico Water Resources Authority, San Juan.
AGUIRRE NUCLEAR PLANT, UNIT 1. PRELIMINARY FACILITY DESCRIPTION AND SAFETY ANALYSIS REPORT, AMENDMENT 19.
5 Jan 73, 44p

Descriptors: *Aguirre power reactor/ unit 1.

For abstract, see NSA 27 06, number 14200.

DOCKET-50382-48 PC$3.00/MF$0.95
Directorate Of Regulatory Operations (Aec), Atlanta, Ga. (Usa). Region Ii.
WATERFORD STEAM ELECTRIC STATION, UNIT 3. STEPS TAKEN TO CORRECT ITEM

OF NONCOMPLIANCE BROUGHT TO ATTENTION IN LETTER OF NOVEMBER 30, 1972.
30 Nov 72, 8p

Descriptors: *Waterford power reactor/ unit .

For abstract, see NSA 27 06, number 14201.

DOCKET-50382-49 PC$3.00/MF$0.95
Louisiana Power And Light Co., New Orleans.
WATERFORD STEAM ELECTRIC STATION, UNIT 3. FUEL DENSIFICATION EFFECTS.
2 Jan 73, 7p

Descriptors: *Waterford power reactor/ unit .

For abstract, see NSA 27 06, number 14202.

DOCKET-50390-32 PC$3.00/MF$0.95
Tennessee Valley Authority, Chattanooga.
WATTS BAR NUCLEAR PLANT, UNITS 1 AND 2. FUEL DENSIFICATION EFFECTS.
29 Dec 72, 2p DOCKET-50391-32

Descriptors: *Watts bar power reactor/ unit .

For abstract, see NSA 27 06, number 14203.

DOCKET-50395-35 PC$3.00/MF$0.95
South Carolina Electric And Gas Co., Columbia.
VIRGIL C. SUMMER NUCLEAR STATION, UNIT 1. FOUNDATION WORK AND BUILDINGS.
21 Dec 72, 2p

Descriptors: *Virgil c. summer power reactor/ unit .

For abstract, see NSA 27 06, number 14204.

DOCKET-50397-36 PC$3.00/MF$0.95
Washington Public Power Supply System, Richland.
HANFORD NO. 2 NUCLEAR POWER PLANT. FUEL DENSIFICATION EFFECTS.
2 Jan 73, 2p

Descriptors: *Hanford power reactor/ unit 2.

For abstract, see NSA 27 06, number 14205.

DOCKET-50398-29 PC$3.00/MF$0.95
Pacific Gas And Electric Co., San Francisco, Calif.
MENDOCINO POWER PLANT, UNITS 1 AND 2. PRELIMINARY SAFETY ANALYSIS REPORT, AMENDMENT 19.
27 Dec 72, 32p DOCKET-50399-29

Descriptors: *Mendocino power reactor/ unit 1, *Mendocino power reactor/ unit 2.

For abstract, see NSA 27 06, number 14206.

DOCKET-50400-33 PC$3.00/MF$0.95
Directorate Of Licensing (Aec), Washington, D. C.
SHEARON HARRIS NUCLEAR POWER PLANT, UNITS 1, 2, 3, AND 4. SAFETY EVALUATION.
22 Dec 72, 183p DOCKET-50401-33, DOCKET-50402-33 DOCKET-50403-34

Descriptors: *Shearon harris power reactor/ unit .

For abstract, see NSA 27 06, number 14207.

DOCKET-50404-33 PC$3.00/MF$0.95
Virginia Electric And Power Co., Richmond.
NORTH ANNA POWER STATION, UNITS 3 AND 4. SERVICE RESERVOIR VOLUME.
29 Dec 72, 4p DOCKET-50405-33

Descriptors: *North anna power reactor/ unit 3, *North anna power reactor/ unit 4.

For abstract, see NSA 27 06, number 14208.

DOCKET-50409-31 PC$3.00/MF$0.95
Dairyland Power Cooperative, La Crosse, Wis.
LA CROSSE BOILING WATER REACTOR. REACTOR VESSEL HEATUP RATE IN EXCESS OF THE TECHNICAL SPECIFICATION LIMIT. UNPLANNED REACTOR SHUTDOWN.
27 Dec 72, 9p

Descriptors: *La crosse boiling-water reactor.

For abstract, see NSA 27 06, number 14119.

DOCKET-50410-18 PC$3.00/MF$0.95
Niagara Mohawk Power Corp., Syracuse, N. Y.
NINE MILE POINT NUCLEAR STATION, UNIT 2. FUEL DENSIFICATION EFFECTS.
3 Jan 73, 1p

Descriptors: *Nine mile point power reactor/ unit 2.

For abstract, see NSA 27 06, number 14209.

DOCKET-50416-12 PC$3.00/MF$0.95
Mississippi Power And Light Co., Jackson (Usa).
GRAND GULF NUCLEAR STATION, UNITS 1 AND 2. FUEL DENSIFICATION EFFECTS.
2 Jan 73, 4p DOCKET-50417-12

Descriptors: *Grand gulf power reactor/ unit 1, *Grand gulf power reactor/ unit 2.

For abstract, see NSA 27 06, number 14210.

DOCKET-50416-13 PC$3.00/MF$0.95
Mississippi Power And Light Co., Jackson (Usa).
GRAND GULF NUCLEAR STATION, UNITS 1 AND 2. ENVIRONMENTAL REPORT, AMENDMENT 1.
21 Dec 72, 72p DOCKET-50417-13

Descriptors: *Environment, *Grand gulf power reactor/ unit 1, *Grand gulf power reactor/ unit 2.

For abstract, see NSA 27 06, number 14211.

DOCKET-50416-14 PC$6.00/MF$0.95
Mississippi Power And Light Co., Jackson (Usa).
GRAND GULF NUCLEAR STATION, UNITS 1 AND 2. PRELIMINARY SAFETY ANALYSIS REPORT, AMENDMENT 1.
21 Dec 72, 460p DOCKET-50417-14

Descriptors: *Grand gulf power reactor/ unit 1, *Grand gulf power reactor/ unit 2.

For abstract, see NSA 27 06, number 14212.

FIND-50269 (12-72) PC$3.00/MF$0.95
Technical Information Center (Aec), Oak Ridge, Tenn.
FIND- OCONEE NUCLEAR STATION UNITS 1, 2, AND 3.
R. L. Gamble. 14 Dec 72, 47p FIND-50270 (12-72), FIND-50287 (12-72)

Descriptors: *Oconee power reactor/ unit 1, *Oconee power reactor/ unit 2, *Oconee power reactor/ unit 3.

For abstract, see NSA 27 06, number 14214.

NP-19476 PC$3.00/MF$0.95
Norsk Atomenergiforening, Oslo.
LECTURES, AUTUMN 1971-SPRING 1972.
Apr 72, 126p
Lang- In Several Languages. U. S. Sales only

Descriptors: *Nuclear power plants.

For abstract, see NSA 27 06, number 14046.

WASH-1208 (12-72) PC$3.00/MF$0.95
Division Of Reactor Development And Technology (Aec), Washington, D. C.
STATUS OF CENTRAL STATION NUCLEAR POWER REACTORS SIGNIFICANT MILESTONES.
1 Dec 72, 10p

Descriptors: *Reactors/ power.

For abstract, see NSA 27 06, number 14121.

18F. Radiation Shielding and Protection

CEA-R-4376 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Grenoble (France). Centre D'Etudes Nucleaires.
SHIELD STUDIES- PROPAGATION OF 14 MEV NEUTRONS IN ACCESS BAFFLES AND CIRCULAR CHANNELS.
P. Logre, P. Bory, D. Couvert, and G. Drouvin.
Nov 72, 74p
Lang- In French. U. S. Sales only

Descriptors: *Neutron sources, *Neutrons, *Shielding.

For abstract, see NSA 27 06, number 13816.

FEI-304 PC$3.00/MF$0.95
Gosudarstvennyi Komitet Po Ispol'Zovaniyu Atomnoi Energii Sssr, Moscow. Fiziko-Energeticheskii Institut.
OPTIMIZATION OF THE FORMS OF PROTECTION NEAR SOURCES OF NEUTRON AND GAMMA-IRRADIATION.
E. E. Petrov, and B. P. Shemetenko. 1971, 28p
Lang- In Russian. U. S. Sales only

Descriptors: *Gamma sources, *Neutron sources, *Shielding.

For abstract, see NSA 27 06, number 13817.

HEDL-SA-409 PC$3.00/MF$0.95
Hanford Engineering Development Lab., Richland, Wash.
DIFFUSION THEORY ANALYSES FOR FAST REACTOR SHIELD DESIGN.
E. T. Boulette, and D. R. Marr. 1972, 20p
CONF-720901-13
Contract AT (45-1)-2170
From Meeting On New Developments In Reactor Physics And Shielding Calculations- Kiamesha Lake, Ny (12 Sep 1972).

Descriptors: *Fast test reactor, *Neutrons/ epithermal, *Neutrons/ fast, *Neutrons/ intermediate, *Neutrons/ thermal, *Reactors/ fast, *Reactors/ liquid metal-cooled.

For abstract, see NSA 27 06, number 13963.

RD/B/M-2377 PC$3.00/MF$0.95
Central Electricity Generating Board, Berkeley (England). Berkeley Nuclear Labs.
COMPUTERISED INFORMATION FILE.
A. J. Fraser. Jul 72, 20p
U. S. Sales only

Descriptors: *Libraries, *Shielding.

For abstract, see NSA 27 06, number 13818.

18G. Radioactive Wastes and Fission Products

ANL-TRANS-921 PC$3.00/MF$0.95
X-RAY MICROANALYSIS OF THE OXIDE (U--PU)O/SUB 2+X/ SIMULATING DIFFERENT BURNUPS.
F. Keroulas, D. Calais, and F. Schmitz. 13p CONF-720843-3

Descriptors: *Fission products, *Plutonium oxides puor, *Reactor fuels, *Uranium oxides uor.

For abstract, see NSA 27 06, number 11680.

ANL-TRANS-923 PC$3.00/MF$0.95
FISSION PRODUCT DISTRIBUTION AND LOCALIZATION BY GAMMA-SPECTROMETRY DURING AND AFTER IRRADIATION.
Ghislain De Contenson, Jean Monier, and Nicole. Vignesoult. 16p CONF-720843-11

Descriptors: *Fission products, *Uranium oxides uor.

For abstract, see NSA 27 06, number 12388.

ANL-TRANS-924 PC$3.00/MF$0.95
MICROPROBE ANALYSIS OF METALLIC FISSION PRODUCTS IN FUELS IN ORDINARY WATER GEOMETRY OPERATING WITH A MOLTEN ZONE.
Jean Bazin, Michel Perrot, and Nicole. Vignesoult. 14p CONF-720843-10

Descriptors: *Fission products, *Uranium oxides uor.

For abstract, see NSA 27 06, number 12389.

ANL-7924 PC$3.00/MF$0.95
Argonne National Lab., Ill.
CHEMICAL ENGINEERING DIVISION BURNUP, CROSS SECTIONS, AND DOSIMETRY SEMIANNUAL REPORT, JANUARY-JUNE 1972.
R. P. Larsen, N. D. Dudey, C. E. Crouthamel, A. D. Tevebaugh, and M. Levenson. Sep 72, 48p
Contract W-31-109-ENG-38

Descriptors: *Californium isotopes cf-252, *Cerium, *Fission products, *Iron isotopes fe-56, *Lanthanum, *Neodymium, *Neptunium isotopes np-237, *Neutrons, *Neutrons/ fast, *Nuclei, *Plutonium isotopes pu- 9, *Plutonium isotopes pu- , *Praseodymium, *Rare earths, *Reactor fuels, *Samarium, *Sulfur isotopes s- , *Tritium, *Uranium isotopes u- , *Uranium isotopes.

For abstract, see NSA 27 06, number 11702.

BNWL-SA-4450 PC$3.00/MF$0.95
Battelle Pacific Northwest Labs., Richland, Wash.
LONG-TERM WASTE MANAGEMENT METHODS.
A. M. Platt, and R. W. Ramsey. 1972, 26p CONF-721107-3
From Symposium On The Management Of Radioactive Wastes From Fuel Reprocessing-Paris, France (27 Nov 1972).

Descriptors: *Radioactive waste.

For abstract, see NSA 27 06, number 12594.

CEA-CONF-2040 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Cadarache (France). Centre D'Etudes Nucleaires.
DETECTION AND MEASURE OF FISSION PRODUCTS AT PEGASE.
C. Desandre-Navarre, J. M. Gouirand, G. Manent, L. Pasdeloup, and M. Vian. 42p CONF-720566-1
Lang- In French. From 21. Meeting Of The Euratom Working Groups On Irradiation Facilities- Julich, Germany (4 May 1972). U. S. Sales only

Descriptors: *Cadarache reactors, *Reactor experimental facilities.

For abstract, see NSA 27 06, number 14250.

GERHTR-10 PC$3.00/MF$0.95
Kernforschungsanlage, Juelich (West Germany). Institut Fuer Reaktorwerkstoffe.
INVESTIGATION AND PRODUCTION OF SPHERICAL DOPED UO/SUB 2/ FUEL PARTICLES. A CONTRIBUTION TO THE CLARIFICATION OF THE RETAINING CAPACITY OF COATED PARTICLES FOR SOLID FISSION PRODUCTS.
Muwaffak Hamesch. Feb 71, 139p JUL-730-RW
Thesis.

Descriptors: *Fission products, *Uranium oxides uor.

For abstract, see NSA 27 06, number 12397.

ORNL-TM-3781 PC$3.00/MF$0.95
Oak Ridge National Lab., Tenn.
ENERGY STORAGE IN HIGH LEVEL RADIOACTIVE WASTE AND SIMULATION AND MEASUREMENT OF STORED ENERGY WITH SYNTHETIC WASTES.
G. H. Jenks, and C. D. Bopp. Jan 73, 50p
Contract W-7405-ENG-26

Descriptors: *Calorimeters, *Energy, *Neutrons/ fast, *Radioactive waste.

For abstract, see NSA 27 06, number 12595.

SSI-1972-19 PC$3.00/MF$0.95
National Inst. Of Radiation Protection, Stockholm (Sweden).
SUGGESTED GUIDELINES FOR THE MANAGEMENT OF RADIOACTIVE WASTE IN SWEDEN.
Jun 72, 40p
Lang- In Swedish. U. S. Sales only

Descriptors: *Radioactive waste, *Sweden.

For abstract, see NSA 27 06, number 12596.

SSI-1972-29 PC$3.00/MF$0.95
National Inst. Of Radiation Protection, Stockholm (Sweden).
PANEL TO EXAMINE THE POSSIBILITY OF ESTABLISHING INTERNATIONAL STORAGE SITES FOR HIGH-LEVEL AND ALPHA BEARING RADIOACTIVE WASTES.
A. Hultgren, and J. O. Snihs. Oct 72, 8p CONF-721128-1
From Panel To Examine The Possibility Of Establishing International Storage Sites For High-level And Alpha Bearing Radioactive Wastes-Vienna, Austria (20 Nov 1972). U. S. Sales only

Descriptors: *Radioactive waste, *Sweden.

For abstract, see NSA 27 06, number 12597.

WAPD-TM-1119 PC$3.00/MF$0.95
Bettis Atomic Power Lab., Pittsburgh, Pa.
/SUP 235/U FISSION PRODUCT DECAY ENERGY 1972 RE-EVALUATION.
K. Shure. Oct 72, 26p
Contract AT-11-1-GEN-14

Descriptors: *Fission products, *Reactors, *Uranium isotopes u- 5.

For abstract, see NSA 27 06, number 14300.

WASH-1198 (1970) PC$3.00/MF$0.95
Division Of Compliance (Aec), Washington, D. C.
REPORT ON RELEASES OF RADIOACTIVITY FROM POWER REACTORS IN EFFLUENTS DURING 1970.
Oct 71, 9p

Descriptors: *Nuclear power plants, *Radioactive waste.

For abstract, see NSA 27 06, number 14219.

18H. Radioactivity

AD-757 305 MF$0.95
Naval Research Lab Washington D C
APPLICATION OF JACOBI POLYNOMIAL METHODS TO THE ONE-SPEED TRANSPORT EQUATION,
G. P. Mueller. 6 Mar 73, 30p
Availability: Available in microfiche only.

Descriptors: (*Neutron transport theory, Hypergeometric functions), (*Radiation damage, Distribution functions), Integral equations, Polynomials, Solids, Ion beams, Numerical analysis.
Identifiers: *Jacobi functions, Legendre functions.

The transport equations associated with radiation damage studies are often solved using expansions in Legendre polynomials. The radiation damage distribution functions may be sharply peaked in the forward direction, while the Legendre polynomials, as a set, are isotropic. This requires the use of many terms in the Legendre expansion. The Jacobi polynomials, on the other hand, can have strong peaking built into their associated weight function. To test the usefulness of these polynomials the author uses them to solve the simple, one-speed, neutron transport equation. The results are then compared to the exact theory and to the results of applying Legendre methods to the same problem. This sample calculation demonstrates the clear advantage of the Jacobi polynomials in strongly non-isotropic situations. (Author)

NYO-3425-6 PC$3.00/MF$0.95
Fraunhofer-Gesellschaft, Garmisch-Partenkirchen (West Germany). Physikalisch-Bioklimatische Forschungsstelle.
PROGRESS REPORT FOR THE PERIOD APRIL 1, 1972 THROUGH NOVEMBER 15, 1972.
Reinhold Reiter. 30 Nov 72, 31p
Contract AT (11-1)-3425

Descriptors: *Atmosphere, *Beryllium isotopes be-7, *Fallout, *Phosphorus isotopes p- , *Sulfur isotopes s- 5.

For abstract, see NSA 27 06, number 11969.

N73-16604 PC$3.50/MF$0.95
Finnish Meteorological Inst., Helsinki.
OBSERVATIONS OF RADIOACTIVITY 1971.
1972, 69p REPT-11

Descriptors: *Air pollution, *Fallout, *Particles, *Radioactive contaminants, *Radioactive isotopes, Aerosols, Finland, Meteorological parameters.

For abstract, see STAR 11 07.

PROT.-SAN.-10/70 PC$3.00/MF$0.95
Comitato Nazionale Per L'Energia Nucleare, Rome (Italy).
DATA ON ENVIRONMENTAL RADIOACTIVITY COLLECTED IN ITALY (JANUARY--DECEMBER 1969).
May 70, 292p
U. S. Sales only

Descriptors: *Environment, *Fallout, *Italy, *Radioactivity.

For abstract, see NSA 27 06, number 11963.

RD/B/N-2431 PC$3.00/MF$0.95
Central Electricity Generating Board, Berkeley (England). Berkeley Nuclear Labs.
ADDITION OF A SECOND /SUP 60/CO SOURCE TO THE B.N.L. GAMMA IRRADIATION FACILITY.
J. V. Best. Oct 72, 17p
U. S. Sales only

Descriptors: *Irradiation facilities.

For abstract, see NSA 27 06, number 12260.

RISO-267 PC$3.00/MF$0.95
Danish Atomic Energy Commission, Risoe. Research Establishment.
ENVIRONMENTAL RADIOACTIVITY IN GREENLAND IN 1971.
A. Aarkrog, and J. Lippert. Jul 72, 18p
U. S. Sales only

Descriptors: *Animals, *Atmospheric precipitation, *Cesium isotopes cs-137, *Crustacea, *Diet, *Greenland, *Osteichthyes, *Plants, *Seawater, *Strontium isotopes sr-9 , *Water supplies.

For abstract, see NSA 27 06, number 11964.

SRARI-P-130 PC$3.00/MF$0.95
Scientific Research Atomic Reactor Inst., Melekess (Ussr).
METHODS FOR INVESTIGATIONS OF EFFECTS OF REACTOR IRRADIATION ON THE ACCURACY OF THERMOCOUPLE READING.
N. V. Markina, B. V. Samsonov, and V. A. Tsykanov. 1971, 21p
Lang- In Russian. U. S. Sales only

Descriptors: *Neutrons, *Reactors, *Thermocouples.

For abstract, see NSA 27 06, number 14297.

18I. Reactor Engineering and Operation

AEC-TR-7341 PC$3.00/MF$0.95
Stuttgart Univ. (West Germany).
STATUS REPORT UPON RESEARCH ON NUCLEAR REACTOR PRESSURE VESSELS COMMISSIONED BY THE FEDERAL MINISTRY FOR EDUCATION AND SCIENCE AT BONN.
78p

Descriptors: *Pressure vessels, *Reactors.

For abstract, see NSA 27 06, number 14288.

AEC-TR-7361 (VOL.2) PC$3.00/MF$0.95
INVESTIGATION OF PROCESSES IN THE PRESSURE RELIEF OF WATER COOLED REACTORS. EXPERIMENTS WITH THE 11.2 M LARGE VESSEL WITHOUT INCORPORATED STRUCTURES. 8TH REPORT FOR THE FEDERAL MINISTRY FOR EDUCATION AND SCIENCE. VOL. II. FINAL REPORT ON RESEARCH PROJECT RS 16.
169p

Descriptors: *Reactors/ boiling, *Reactors/ pressurized-water.

For abstract, see NSA 27 06, number 14029.

AEC-TR-7363 PC$3.00/MF$0.95
Technische Universitaet, Munich (West Germany).
BLOWDOWN PROGRAM FOR BOILING WATER REACTORS WITH WATER JET PUMPS.
F. Steinhoff. 70p

Descriptors: *Pumps, *Reactors/ boiling.

For abstract, see NSA 27 06, number 13966.

AEC-TR-7394 PC$6.00/MF$0.95
BURNOUT TESTS IN CONNECTION WITH SAFETY RESEARCH. FINAL REPORT, PARTS I AND II.
W. Kastner, and F. Mayinger. 330p

Descriptors: *Reactor fuel elements, *Reactors/ boiling, *Reactors/ pressurized-water.

For abstract, see NSA 27 06, number 14030.

AI-AEC-13041 PC$3.00/MF$0.95
Atomics International, Canoga Park, Calif.
LMFBR SAFETY PROGRAMS. QUARTERLY TECHNICAL PROGRESS REPORT, JULY-SEPTEMBER 1972.
15 Nov 72, 18p
Contract AT (04-3)-824

Descriptors: *Liquid metal fast breeder reactor, *Sodium.

For abstract, see NSA 27 06, number 14031.

ANL/EBR-66 PC$3.00/MF$0.95
Argonne National Lab., Ill.
PROSPECTUS FOR OPERATING EBR-II WITH HIGH-WORTH CONTROL RODS.
R. A. Cushman, B. R. Sehgal, and V. W. Lowery. Sep 72, 96p
Contract W-31-109-ENG-38

Descriptors: *Experimental breeder reactor-ii.

For abstract, see NSA 27 06, number 13956.

ANL/EBR-67 PC$3.00/MF$0.95
Argonne National Lab., Ill. Argonne National Lab., Idaho Falls, Idaho.
PRELIMINARY DESIGN AND TEST OF A PROPOSED TURBINE-DRIVEN OSCILLATOR FOR EBR-II.
J. H. Cole, J. R. Karvinen, and C. C. Price. Oct 72, 31p
Contract W-31-109-ENG-38

Descriptors: *Experimental breeder reactor-ii, *Reactor oscillators.

For abstract, see NSA 27 06, number 14248.

BARC-615 PC$3.00/MF$0.95
Bhabha Atomic Research Centre, Bombay (India).
WATER CHEMISTRY STUDIES. VIII. DEOXYGENATION OF REACTOR COOLANT WATER- A STATUS REPORT.
S. V. Narasimhan, K. S. Krishna Rao, and K. S. Venkateswarlu. 1972, 43p
U. S. Sales only

Descriptors: *Hydrazine, *Ion exchange materials, *Oxygen, *Reactors/ power, *Reactors/ water-cooled, *Sodium sulfites, *Water.

For abstract, see NSA 27 06, number 13967.

BARC-616 PC$3.00/MF$0.95
Bhabha Atomic Research Centre, Bombay (India).
WATER CHEMISTRY STUDIES. IX. INVESTIGATIONS ON DEPOSITION AND CHEMICAL CLEANING OF MANGANESE, IRON, COBALT, AND COPPER ON METALLIC SURFACES ENCOUNTERED IN PRIMARY HEAT TRANSPORT AND MODERATOR SYSTEMS OF WATER COOLED NUCLEAR POWER REACTORS.
P. K. Mathur, and K. S. Venkateswarlu. 1972, 16p
U. S. Sales only

Descriptors: *Acetic acid/ ETHYLENEDINITRILOtetra-, *Cobalt, *Copper, *Hydrogen peroxides, *Iron, *Manganese, *Oxalic acid, *Reactors/ power, *Reactors/ water-cooled.

For abstract, see NSA 27 06, number 13968.

BNWL-CC-2345 PC$3.00/MF$0.95
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
PROGRAM DESCRIPTION- AN INVESTIGATION OF BLOWDOWN HEAT TRANSFER AND HYDRAULICS.
29 Jan 70, 37p
Contract AT (45-1)-1830

Descriptors: *Reactor fuel elements, *Reactors/ boiling, *Reactors/ power.

For abstract, see NSA 27 06, number 14032.

CEA-CONF-1896 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Saclay (France). Centre D'Etudes Nucleaires.
CONTROL OF TIGHTNESS OF COMPONENTS OF THE PHENIX BULK REACTOR.
B. Blanc, and R. Roulliay. 11p CONF-720553-1
Lang- In French. From Meeting On The Detection Of Leaks And Tightness Tests- Paris, France (16 May 1972). U. S. Sales only

Descriptors: *Phenix fast reactor.

For abstract, see NSA 27 06, number 13969.

CEA-R-4404 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Saclay (France). Centre D'Etudes Nucleaires.
IRRADIATION DEVICE FOR THE POWER CYCLING OF A FUEL PENCIL WITH A CONSTANT CLADDING TEMPERATURE AND A FAST INTENSE FLUX- ELSA CAPSULE.
Paul Breant. Dec 72, 47p
Lang- In French. U. S. Sales only

Descriptors: *Reactor experimental facilities, *Saclay reactors OSIRIS.

For abstract, see NSA 27 06, number 14252.

CONF-720846-2 PC$3.00/MF$0.95
State Electricity Commission Of Victoria (Australia).
CURRENT STATUS AND PROSPECTS FOR COMMERCIAL NUCLEAR REACTOR SYSTEMS- THE UTILITY VIEWPOINT.
J. E. Hayes, and J. B. Herbert. 1972, 33p
From 44. Congress Of The Australian And New Zealand Association For The Advancement Of Science Symposium-. Sydney, Australia (14 Aug 1972). U. S. Sales only

Descriptors: *Australia, *New zealand, *Nuclear power plants.

For abstract, see NSA 27 06, number 14045.

CONF-720849-1 PC$3.00/MF$0.95
Atomics International, Canoga Park, Calif. Liquid Metal Engineering Center.
ANTICIPATION OF OPERATING PROBLEMS IN THE DESIGN OF HEAT TRANSFER EQUIPMENT.
K. A. Gardner. 1972, 26p
Contract AT (04-3)-700
From Recent Developments In Heat Exchangers Seminar- Trogir, Yugoslavia (30 Aug 1972).

Descriptors: *Heat exchangers.

For abstract, see NSA 27 06, number 11919.

CONF-720958-1 PC$3.00/MF$0.95
Atomics International, Canoga Park, Calif. Liquid Metal Engineering Center.

RATCHETTING DEFORMATION AS AFFECTED BY RELATIVE VARIATIONS OF THE LOADING SEQUENCE.
W. F. Anderson. 1972, 21p
Contract AT (04-3)-700
From 27. Annual Petroleum Mechanical Engineering Conference With The 3rd Pressure Vessels And Piping Conference- New Orleans, La (27 Sep 1972).

Descriptors: *Heat-resisting alloys and metals, *Reactors.

For abstract, see NSA 27 06, number 12456.

CONF-721006-2 PC$3.00/MF$0.95
EXPERIMENTAL INVESTIGATIONS CONCERNING THE SAFETY OF SNR STRAIGHT--PIPE STEAM GENERATORS IN SODIUM--WATER REACTIONS.
K. Dumm, and N. J. Van Waveren. 30p

Descriptors: *Snr reactor.

For abstract, see NSA 27 06, number 13970.

CONF-721112-4 PC$3.00/MF$0.95
Oak Ridge National Lab., Tenn.
COMPARISONS OF HIGH-TEMPERATURE STRUCTURAL TEST RESULTS WITH INELASTIC ANALYSIS PREDICTIONS BASED ON INTERIM CONSTITUTIVE EQUATIONS FOR LIQUID-METAL FAST BREEDER REACTOR SYSTEM COMPONENTS.
J. M. Corum. 1972, 32p
Contract W-7405-ENG-26
From American Society Of Mechanical Engineers Winter Meeting- New York, Ny (26 Nov 1972).

Descriptors: *Liquid metal fast breeder reactor.

For abstract, see NSA 27 06, number 13945.

DUN-SA-157 PC$3.00/MF$0.95
Douglas United Nuclear, Inc., Richland, Wash.
FAULT TREE ANALYSIS WITH PROBABILITY EVALUATION.
P. A. Crosetti. 20 Oct 70, 17p CONF-701109-6
From Ieee Nuclear Science Symposium- New York, Ny (4 Nov 1970).

Descriptors: *Reactors.

For abstract, see NSA 27 06, number 14035.

DUN-7905 PC$3.00/MF$0.95
Douglas United Nuclear, Inc., Richland, Wash.
STATUS OF THE 117-N CHARCOAL FILTERS, MARCH 1972.
E. C. Bennett, and D. E. Strege. 14 Mar 72, 15p

Descriptors: *Filters, *Hanford production reactors N, *Reactor containment systems.

For abstract, see NSA 27 06, number 14286.

DUN-7985 PC$3.00/MF$0.95
Douglas United Nuclear, Inc., Richland, Wash.
EVALUATION OF WEATHERED IMPREGNATED CHARCOALS FOR RETENTION OF IODINE AND METHYL IODIDE.
E. C. Bennett, and D. E. Strege. 30 Jun 72, 21p

Descriptors: *Charcoal, *Hanford production reactors N, *Iodine, *Methane/ iodo-.

For abstract, see NSA 27 06, number 14287.

FEI-249 PC$3.00/MF$0.95
Gosudarstvennyi Komitet Po Ispol'Zovaniyu Atomnoi Energii Sssr, Obninsk. Fiziko-Energeticheskii Institut.
USE OF A MODEL OF A POROUS BODY FOR CALCULATING THE FIELD, VELOCITY, AND TEMPERATURE OF A REACTOR CORE.
A. P. Kolmakov, and Yu. S. Yur'ev. 1971, 11p
Lang- In Russian. U. S. Sales only

Descriptors: *Reactors.

For abstract, see NSA 27 06, number 14320.

FEI-306 PC$3.00/MF$0.95
Gosudarstvennyi Komitet Po Ispol'Zovaniyu Atomnoi Energii Sssr, Moscow. Fiziko-Energeticheskii Institut.
EXPERIMENTAL-CALCULATION STUDIES OF THE PHYSICS OF THE CONTROLS OF THE BN-350 REACTOR CARRIED OUT ON THE ASSEMBLY BFS-22.
V. V. Orlov, M. F. Troyanov, and V. F. Mamontov. 1972, 35p
Lang- In Russian. U. S. Sales only

Descriptors: *Bn-350 reactor.

For abstract, see NSA 27 06, number 13957.

FRNC-CONF-41 PC$3.00/MF$0.95
Societe Stein Industrie, Paris (France).
HYDROTECHNICAL PROBLEMS ASSOCIATED WITH THE STEAM GENERATORS OF PHENIX.
M. Andro, and M. Salon. 1972, 6p CONF-720648-10
Lang- In French. From 12. Meeting On Hydraulics- Paris, France (6 Jun 1972). U. S. Sales only

Descriptors: *Phenix fast reactor.

For abstract, see NSA 27 06, number 13971.

GULF-GA-A-12325 PC$3.00/MF$0.95
Gulf General Atomic Co., San Diego, Calif.
PUBLIC SERVICE COMPANY OF COLORADO 330-MW (E) HIGH-TEMPERATURE GAS--COOLED REACTOR RESEARCH AND DEVELOPMENT PROGRAM. QUARTERLY PROGRESS REPORT FOR THE PERIOD ENDING SEPTEMBER 30, 1972.
31 Oct 72, 42p
Contract AT (04-3)-633

Descriptors: *Fort st. vrain power reactor/ unit 1, *Reactor fuel elements.

For abstract, see NSA 27 06, number 14076.

HEDL-TME-71-124 PC$3.00/MF$0.95
Hanford Engineering Development Lab., Richland, Wash.
OVERALL OUTLINE OF RESPONSIBILITY FOR CONSTRUCTION OF THE FAST FLUX TEST FACILITY.
Sep 71, 10p
Contract AT (45-1)-2170

Descriptors: *Fast flux test facility, *Fast test reactor.

For abstract, see NSA 27 06, number 14259.

HEDL-TME-72-111 PC$3.00/MF$0.95
Hanford Engineering Development Lab., Richland, Wash.
IVHM PROTOTYPE GRAPPLE TESTS WITH SIMULATED CORE MOCKUP (SCM).
L. F. Kocher. Oct 72, 48p
Contract AT (45-1)-2170

Descriptors: *Fast test reactor, *Remote-handling equipment.

For abstract, see NSA 27 06, number 14260.

HEDL-TME-72-119 PC$3.00/MF$0.95
Hanford Engineering Development Lab., Richland, Wash.
FTR DRIVER PISTON RING WATER LEAKAGE RATES.
R. E. Collingham, and V. R. Hill. Oct 72, 61p
Contract AT (45-1)-2170

Descriptors: *Fast test reactor.

For abstract, see NSA 27 06, number 14261.

JUL-885-RG PC$3.00/MF$0.95
Kernforschungsanlage, Juelich (West Germany). Institut Fuer Reaktorentwicklung.
NOISE THERMOMETRY AS A METHOD FOR TEMPERATURE MEASUREMENT IN NUCLEAR REACTORS.
H. Brixy. Jun 72, 130p
Lang- In German. Thesis. U. S. Sales only

Descriptors: *Reactors, *Thermometers.

For abstract, see NSA 27 06, number 12212.

K-1832 PC$3.00/MF$0.95
Oak Ridge Gaseous Diffusion Plant, Tenn.
EXPERIMENTAL DETERMINATION OF THE PERFORMANCE CHARACTERISTICS OF EIGHT COMPACT HEAT TRANSFER SURFACES.
B. Cox, and P. A. Jallouk. 27 Dec 72, 97p
Contract W-7405-ENG-26

Descriptors: *Heat exchangers.

For abstract, see NSA 27 06, number 11920.

NAA-SR-MEMO-2662 PC$3.00/MF$0.95
Atomics International, Canoga Park, Calif.
NATURAL CONVECTIVE FLOW IN THE PRIMARY SODIUM SYSTEM AFTER A REACTOR SCRAM.
T. L. Gershun. 15 Apr 58, 10p

Descriptors: *Hallam power reactor.

For abstract, see NSA 27 06, number 13972.

N73-16641 PC$3.25/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
AN 810 FT/SEC SOIL IMPACT TEST OF A 2--FOOT DIAMETER MODEL NUCLEAR REACTOR CONTAINMENT SYSTEM.
R. L. Puthoff. Dec 72, 22p NASA-TM-X-68180, E-7275

Descriptors: *Containers, *Drop tests, *Fission products, *Fracture strength, *Nuclear reactors, Crack initiation, Impact tests, Radiation hazards, Soils, Spherical shells.

For abstract, see STAR 11 07.

ORNL-TR-2647 PC$3.00/MF$0.95
GERMAN RESEARCH PROGRAM ON REACTOR SAFETY.
8p

Descriptors: *Federal republic of germany, *Reactor safety, *Reactors/ power.

For abstract, see NSA 27 06, number 14217.

ORNL-4812 PC$6.00/MF$0.95
Oak Ridge National Lab., Tenn.
DEVELOPMENT STATUS OF MOLTEN-SALT BREEDER REACTORS.
Aug 72, 416p
Contract W-7405-ENG-26

Descriptors: *Reactors/ breeder, *Reactors/ molten-salt.

For abstract, see NSA 27 06, number 13949.

PWAC-264 PC$3.00/MF$0.95
Pratt And Whitney Aircraft, Middletown, Conn.
PRELIMINARY ENGINEERING DESIGN REPORT FOR A LITHIUM-COOLED REACTOR EXPERIMENT, FEBRUARY 13, 1959.
18 Mar 59, 222p
Contract AT (11-1)-229
Declassified 31 Oct 1972.

Descriptors: *Pressure vessels, *Reactors/ aircraft.

For abstract, see NSA 27 06, number 14235.

PWAC-371 PC$3.00/MF$0.95
Pratt And Whitney Aircraft, Middletown, Conn.
DESIGN AND TESTING OF COLUMBIUM-1 ZIRCONIUM REACTOR PRESSURE VESSELS.
15 Oct 62, 79p
Contract AT (30-1)-2789
Declassified 31 Oct 1972.

Descriptors: *Pressure vessels, *Reactors/ aircraft.

For abstract, see NSA 27 06, number 14236.

RD/B/M-1956 PC$3.00/MF$0.95
Central Electricity Generating Board, Berkeley (England). Berkeley Nuclear Labs.
RESULTS OF HEAT TRANSFER AND PRESSURE DROP TESTS IN THE B.N.L. AIR RIGS ON SURFACES ROUGHENED BY TRANSVERSE RIBS.
C. Warburton. Oct 72, 16p
U. S. Sales only

Descriptors: *Air, *Rods, *Windscale advanced gas-cooled reactor.

For abstract, see NSA 27 06, number 11922.

RD/B/N-2404 PC$3.00/MF$0.95
Central Electricity Generating Board, Berkeley (England). Berkeley Nuclear Labs.
INVESTIGATION OF FLOW PARAMETERS FOR A SERIES OF CONCENTRIC ROUGH PIN AND SMOOTH CHANNEL ASSEMBLIES.
C. J. Lee. Sep 72, 32p
U. S. Sales only

Descriptors: *Gas flow, *Windscale advanced gas-cooled reactor.

For abstract, see NSA 27 06, number 11923.

RT/ING- (72)10 PC$3.00/MF$0.95
Comitato Nazionale Energia Nucleare, Rome (Italy). Divisione Affari Internazionali E Studi Economici.
PROBLEMS CONNECTED WITH SODIUM FUEL INTERACTION IN THE PEC REACTOR SAFETY EVALUATION.
L. De Cecco, and E. Santandrea. 23 Jun 72, 27p
RVT-PEC-610
U. S. Sales only

Descriptors: *Pec fast test reactor.

For abstract, see NSA 27 06, number 14267.

SRARI-P-139 PC$3.00/MF$0.95
Scientific Research Atomic Reactor Inst., Melekess (Ussr).
EFFECT OF PARTIAL OVERLOADS ON THE CHARACTERISTICS OF HIGH-FLUX REACTORS OF THE TRAP TYPE.
V. A. Tsykanov. 1972, 20p
Lang- In Russian. U. S. Sales only

Descriptors: *Reactors/ research.

For abstract, see NSA 27 06, number 14269.

TRG-REPORT-2366 PC$3.00/MF$0.95
United Kingdom Atomic Energy Authority, Risley (England). Reactor Group.
PRELIMINARY EXPERIMENTAL STUDIES OF THE INTERACTION OF WATER WITH MOLTEN LEAD AND MOLTEN SALT MIXTURES.
J. J. Hillary, P. Curry, and L. R. Taylor. Dec 72, 20p CONF-721006-3
From International Conference On Engineering Of Fast Reactors For Safe And Reliable Operation-Karlsruhe, Germany (9 Oct 1972). U. S. Sales only

Descriptors: *Fused salts, *Lead, *Reactors/ fast, *Reactors/ liquid metal-cooled, *Water.

For abstract, see NSA 27 06, number 14037.

18J. Reactor Materials

AD-757 653 PC$3.00/MF$0.95
Naval Research Lab Washington D C
COOPERATIVE RADIATION EFFECTS SIMULATION PROGRAM.
Semiannual progress rept. 1 May-31 Oct 72,
L. E. Steele, and E. A. Wolicki. Feb 73, 81p Rept no. NRL-MR-2555
See also report dated Aug 72, AD-749 006.

Descriptors: (*Reactor materials, *Radiation damage), Ion bombardment, Nickel, Stainless steel, Nuclear scattering, Fatigue (Mechanics), Helium, Embrittlement, Simulation, Defects (Materials).
Identifiers: Steel 316, Computer aided analysis.

The goal of the research is to provide the theoretical and experimental bases for understanding the mechanisms of void nucleation and growth and the influence of helium on both mechanical properties and void nucleation, as well as a theoretical insight into energy deposition processes. In this program, the Van de Graaff and Cyclotron are used to rapidly simulate the radiation damage produced over long operating periods in reactor neutron environments. This third semiannual progress report includes: (1) an electron microscopy analysis of nickel-ion bombarded nickel, (2) studies using small angle x-ray scattering techniques, (3) observations of helium migration in 316 stainless steel, (4) the effect of Cyclotron-injected helium on the fatigue properties of 316 stainless steel, (5) an improved computer program for calculating energy deposition in matter by energetic heavy ions, (6) the development of a nickel beam intensity at the Van de Graaff which is one of the highest available anywhere, and (7) the use of a coincident alpha alpha elastic scattering technique for non-destructive measurement of the content and concentration depth profile of helium in thin metal foils. (Author Modified Abstract)

AD-757 725 PC$7.75/MF$0.95
Naval Intelligence Support Center Washington D C Translation Div
STRUCTURAL MATERIALS FOR FABRICATION OF SHIP REACTORS AND STEAM GENERATORS,
P. A. Manko, and B. E. Soloimakii. 2 Feb 73, 114p Rept no. NISC-Trans-3385
Trans. of mono. Kostruktivnye Materialy dlya Izgstovleniya Sudovykh Reaktorov Parogeneratorov, n.p., 1969 p31-5108, 167-179, 187-195, 208-210.

Descriptors: (*Reactor materials, Marine nuclear propulsion), (*Boilers, Marine engineering), Materials, Manufacturing methods, Steel, Stainless steel, Zirconium alloys, Alluminum alloys, Radiation damage, Corrosion resistance, Mechanical properties, Quality control, Non-destructive testing, Ultrasonic radiation, Assembling, Material forming, Welding, Heat treatment, USSR.
Identifiers: Translations, Ultrasonic tests.

Contents:
- Structural materials for nuclear reactors and steam generators;
- Technology of fabrication of basic parts and subassemblies of reactors and boilers;
- Quality control of reactor and steam generator parts and assemblies by means of ultrasonic flaw detection;
- Assembly of reactors and steam boilers on board ships.

AEEW-M-1134 PC$3.00/MF$0.95
Atomic Energy Establishment, Winfrith (England).
RE-ASSESSMENT OF MEASUREMENTS OF FAST NEUTRON DAMAGE IN GRAPHITE MADE IN DIDO AND BEPO.
F. R. Barclay, and C. F. Griggs. Oct 72, 16p RPC (GP)/P- (72)23
U. S. Sales only

Descriptors: *Graphite, *Neutrons/ fast.

For abstract, see NSA 27 06, number 12567.

AEEW-R-776 PC$3.00/MF$0.95
Atomic Energy Establishment, Winfrith (England).
APEX- A FUEL MANAGEMENT CODE FOR HTR'S.
K. G. Pearson. Aug 72, 42p
U. S. Sales only

Descriptors: *Computer programs, *Reactor fuels, *Reactors/ gas-cooled.

For abstract, see NSA 27 06, number 14023.

AERE-R-6830 PC$3.00/MF$0.95
Atomic Energy Research Establishment, Harwell (England).
THERMAL DIFFUSION PHENOMENA IN NON-STOICHIOMETRIC OXIDE FUELS. PART I. EVIDENCE OF GAS PHASE OXYGEN TRANSPORT IN UO/SUB 2 + X/ FROM AXIAL AND RADIAL TEMPERATURE-GRADIENT EXPERIMENTS.
M. G. Adamson, and R. F. A. Carney. Oct 72, 42p
U. S. Sales only

Descriptors: *Uranium oxides uor.

For abstract, see NSA 27 06, number 12384.

AERE-R-6831 PC$3.00/MF$0.95
Atomic Energy Research Establishment, Harwell (England).
THERMAL DIFFUSION PHENOMENA IN NON-STOICHIOMETRIC OXIDE FUELS. PART II. OXYGEN REDISTRIBUTION IN HYPERSTOICHIOMETRIC URANIA-PLUTONIA. RESULTS OF AXIAL TEMPERATURE-GRADIENT EXPERIMENTS.
M. G. Adamson, and R. F. A. Carney. Oct 72, 15p
U. S. Sales only

Descriptors: *Plutonium oxides puor, *Uranium oxides uor.

For abstract, see NSA 27 06, number 12385.

AES-10 PC$3.00/MF$0.95
Aktiebolaget Atomenergi, Studsvik (Sweden).
SUPPLY OF ENRICHED URANIUM.
M. Martensson. 1972, 54p
Lang- In Swedish. U. S. Sales only

Descriptors: *Uranium.

For abstract, see NSA 27 06, number 12248.

ANCR-1081 PC$3.00/MF$0.95
Aerojet Nuclear Co., Idaho Falls, Idaho.
EVALUATION (USING A HYBRID COMPUTER) OF A SHEATH TYPE ELECTRICAL HEATER LOD FOR SIMULATING THE RESPONSE OF A NUCLEAR FUEL ROD.
J. R. Larson, and J. R. Venhuizen. Nov 72, 59p
Contract AT (10-1)-1375

Descriptors: *Heaters, *Reactor fuel elements, *Reactors/ pressurized-water.

For abstract, see NSA 27 06, number 13980.

ANL-TRANS-919 PC$3.00/MF$0.95
MODIFICATION OF THE OXIDATION POTENTIAL OF THE MIXED OXIDES (U,PU)O/SUB 2/ AS A FUNCTION OF THE BURNUP.
F. Schmitz, J. Marticorena, and G. Dean. 15p
CONF-720843-8
From Behaviour And Chemical State Of Fission Products In Irradiated Fuel Meeting- Vienna, Austria (7 Aug 1972).

Descriptors: *Fission products, *Plutonium oxides puor, *Uranium oxides uor.

For abstract, see NSA 27 06, number 14289.

ANL-TRANS-920 PC$3.00/MF$0.95
VARIATION OF THE CARBON ACTIVITY AS A FUNCTION OF THE BURNUP IN A CARBIDE FUEL.
Nicole Lorenzelli, and J. P. Marcon. 16p
CONF-720843-5
From Behaviour And Chemical State Of Fission Products In Irradiated Fuel Meeting- Vienna, Austria (7 Aug 1972).

Descriptors: *Carbon, *Plutonium carbides, *Reactor fuels, *Uranium carbides.

For abstract, see NSA 27 06, number 14290.

ANL-TRANS-926 PC$3.00/MF$0.95
REACTION AT THE INTERFACE OF CLADDING (STAINLESS STEEL) AND FUEL (MIXED OXIDE (U,PU)O/SUB 2 +-X/) IN FUEL ELEMENTS IRRADIATED BY FAST NEUTRONS.
D. Calais, M. Conte, F. De Keroulas, and R. Lebeuze. 15p CONF-720843-12

Descriptors: *Neutrons/ fast, *Plutonium oxides puor, *Stainless steel, *Uranium oxides uor.

For abstract, see NSA 27 06, number 12391.

ANL-TRANS-927 PC$3.00/MF$0.95
DEMONSTRATION OF OXYGEN MIGRATION DURING IRRADIATION- IRRADIATION L-1.
M. Trotabas, F. De Keroulas, and J. P. Gatesoupe. 12p CONF-720843-9

Descriptors: *Plutonium oxides puor, *Radiation, *Uranium oxides uor.

For abstract, see NSA 27 06, number 12392.

ANL-TRANS-928 PC$3.00/MF$0.95
THERMAL DIFFUSION AND VAPORIZATION IN IRRADIATED MIXED OXIDES VARIATION OF THE RATIO PU/U+PU.
M. Mouchnino. 14p CONF-720843-7

Descriptors: *Neutrons/ epithermal, *Neutrons/ fast, *Neutrons/ thermal, *Plutonium oxides puor, *Uranium oxides uor.

For abstract, see NSA 27 06, number 12393.

ANL-TRANS-929 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Grenoble (France). Centre D'Etudes Nucleaires.
FISSION GAS EMISSION BY URANIUM OXIDE IN FUEL ELEMENTS.
Pierre Chenebault, and Roger Delmas. 12p
CONF-720843-1

Descriptors: *Fission products, *Uranium oxides uor.

For abstract, see NSA 27 06, number 14291.

ANL-TRANS-932 PC$3.00/MF$0.95
REPROCESSING PROJECT- PYROCHEMICAL HEAD-END PROCESS-MOLTEN SALT ELECTROLYTIC CUTTING.
26p

Descriptors: *Reactor fuel elements.

For abstract, see NSA 27 06, number 11882.

ANL-7922 PC$3.00/MF$0.95
Argonne National Lab., Ill.
CHEMICAL ENGINEERING DIVISION, FUELS AND MATERIALS CHEMISTRY SEMIANNUAL REPORT, JANUARY-JUNE 1972.
M. G. Chasanov, C. E. Johnson, and J. E. Battles. Oct 72, 60p
Contract W-31-109-ENG-38

Descriptors: *Liquid metal fast breeder reactor, *Reactor fuels.

For abstract, see NSA 27 06, number 12386.

ANL-7954 PC$3.00/MF$0.95
Argonne National Lab., Ill.
PERFORMANCE OF VIBRATORILY COMPACTED MIXED-OXIDE FUEL ELEMENTS IN EBR-II TO 2.7 AT. PERCENT BURNUP.
F. L. Brown, L. A. Neimark, and J. E. Ayer. Jun 70, 36p
Contract W-31-109-ENG-38

Descriptors: *Experimental breeder reactor-ii, *Reactor fuel elements.

For abstract, see NSA 27 06, number 13981.

BARC-580 PC$3.00/MF$0.95
Bhabha Atomic Research Centre, Bombay (India).
FAST FISSION RATIO MEASUREMENTS IN MULTI-ROD CLUSTERS.
A. Rose, H. M. Jain, and P. F. Menezes. 1972, 52p
U. S. Sales only

Descriptors: *Reactor fuel elements, *Reactors/ boiling, *Uranium oxides uor.

For abstract, see NSA 27 06, number 13982.

BNFL-REPORT-83 PC$3.00/MF$0.95
British Nuclear Fuels Ltd., Risley (England).
PLUTONIUM ACCOUNTANCY IN COMMERCIAL TRANSACTIONS INVOLVING PLUTONIUM OXIDE.
K. A. Swinburn. 1972, 4p
U. S. Sales only

Descriptors: *Nuclear materials management, *Plutonium oxides puor, *Sampling.

For abstract, see NSA 27 06, number 12588.

BNWL-TR-77 PC$3.00/MF$0.95
INVESTIGATION OF THE DISTRIBUTION OF CAVITIES OVER THE PERIMETER OF X18H9T STEEL FUEL ELEMENT CANS OF THE BR-5 REACTOR.
V. F. Rentov, K. G. Farkhutdinov, and A. Ya. Ladygin. 10p

Descriptors: *Reactors/ research.

For abstract, see NSA 27 06, number 14249.

BNWL-TR-78 PC$3.00/MF$0.95
INVESTIGATION OF THE ESCAPE OF FISSION FRAGMENTS FROM CERAMIC NUCLEAR FUEL.
B. V. Samsonov, and A. K. Frey. 19p

Descriptors: *Uranium carbides, *Uranium nitrides, *Uranium oxides uor, *Xenon isotopes xe- , *Xenon isotopes xe- 5, *Xenon isotopes xe- 8.

For abstract, see NSA 27 06, number 14292.

BNWL-TR-81 PC$3.00/MF$0.95
Kernforschungszentrum, Karlsruhe (West Germany). Institut Fuer Material Und Festkoerperforschung.
RECOVERY PROCESSES IN OXYGEN SUBLATTICES OF QUENCHED AND NEUTRON-IRRADIATED URANIUM DIOXIDE.
D. Vollath. 39p

Descriptors: *Neutrons, *Uranium oxides uor.

For abstract, see NSA 27 06, number 12394.

BNWL-1576 PC$3.00/MF$0.95
Battelle Pacific Northwest Labs., Richland, Wash.
EFFECT OF IRRADIATION LEVEL ON THE RUPTURE TEMPERATURE OF ZIRCALOY-2 CLAD URANIUM FUEL TUBES.
D. L. Reid, and G. M. Hesson. Jun 71, 40p
Contract AT (45-1)-1830
For Douglas United Nuclear, Inc., Richland, Wash.

Descriptors: *Neutrons/ pile, *Reactor fuel elements, *Uranium, *Zircaloy- .

For abstract, see NSA 27 06, number 12556.

CEA-CONF-2062 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Fontenay-Aux-Roses (France). Centre D'Etudes Nucleaires.
THERMAL DIFFUSIVITY OF URANIUM OXIDE AND THORIUM OXIDE AT HIGH TEMPERATURE.
J. C. Weilbacher. 1970, 20p CONF-720661-2
Lang- In French. From 3. European Conference On Thermophysical Properties Of Solids At High Temperatures- Turin, Italy (20 Jun 1972). U. S. Sales only

Descriptors: *Thorium oxides thor, *Uranium oxides uor.

For abstract, see NSA 27 06, number 12395.

CEA-CONF-2095 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Saclay (France). Centre D'Etudes Nucleaires.
STUDY OF THE FATIGUE OF NUCLEAR FUEL CENTERING DEVICES.
P. Millet, and M. Weisz. 1972, 23p CONF-720664-1
Lang- In French. From 15. Colloquium On Metallurgy. U. S. Sales only

Descriptors: *Magnesium alloys and systems, *Reactor fuel elements, *Zirconium alloys and systems.

For abstract, see NSA 27 06, number 13983.

CEA-CONF-2117 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Paris (France).
DETERMINATION OF /SUP 237/NP IN TRACE AMOUNTS IN URANIUM AND PLUTONIUM.
P. Guay, and F. Pinelli. 9p CONF-721010-13
Lang- In French. From International Conference On Modern Trends In Activation Analysis- Saclay, France (2 Oct 1972). U. S. Sales only

Descriptors: *Neptunium isotopes np-237, *Plutonium isotopes pu- 8, *Plutonium isotopes pu- 9, *Uranium.

For abstract, see NSA 27 06, number 11650.

CEA-R-4364 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Paris (France).
RESULTS OF AN INTERLABORATORY COMPARISON ON THE ANALYSIS OF PU.
Oct 72, 22p

Lang- In French. U. S. Sales only

Descriptors: *Aluminum, *Chromium, *Cobalt, *Copper, *Iron, *Lead, *Manganese, *Molybdenum, *Nickel, *Plutonium, *Silicon, *Tin.

For abstract, see NSA 27 06, number 11681.

CONF-701074-12 PC$3.00/MF$0.95
PROSPECTS OF THE USE OF COMPLEXONES IN NUCLEAR POWER ENGINEERING.
T. Kh. Margulova, N. G. Rassokhin, S. A. Tevlin, S. V. Bogatyreva, and L. M. Bursuk. 13p

Descriptors: *Acetic acid/ ETHYLENEDINITRILOtetra-, *Boilers, *Nuclear power plants, *Steel.

For abstract, see NSA 27 06, number 11744.

CONF-720662-2 PC$3.00/MF$0.95
British Nuclear Fuels Ltd., Risley (England).
FAST REACTOR FUEL MANUFACTURE.
W. C. L. Kent, and A. S. Davidson. 1972, 12p
From Seminar On Nuclear Energy- Barcelona, Spain (6 Jun 1972). U. S. Sales only

Descriptors: *Plants INDUSTRIAL, *Radiochemical processing plants, *Reactor fuels.

For abstract, see NSA 27 06, number 12396.

DOCKET-50201-137 PC$3.00/MF$0.95
Directorate Of Licensing (Aec), Washington, D. C.
WEST VALLEY REPROCESSING PLANT. EXEMPTED FROM 30 AND 90 DAY REPORTING PERIODS. CHANGE IN TECHNICAL SPECIFICATION REQUIRES ADDITIONAL INFORMATION. TECHNICAL SPECIFICATIONS, CHANGE 15 EFFECTIVE DATE DEFERRED.
11 Dec 72, 6p

Descriptors: *West valley processing plant.

For abstract, see NSA 27 06, number 11883.

DUN-SA-193 PC$3.00/MF$0.95
Douglas United Nuclear, Inc., Richland, Wash.
CRITICALITY CONTROL PARAMETERS FOR DISCHARGED FUEL.
R. L. Miller, and H. Toffer. 31 Oct 72, 22p
CONF-721109-17
From International Conference On Nuclear Solutions To World Energy Problems- Washington, Dc (12 Nov 1972).

Descriptors: *Criticality, *Reactor fuel elements.

For abstract, see NSA 27 06, number 12604.

DUN-7794 PC$3.00/MF$0.95
Douglas United Nuclear, Inc., Richland, Wash.
DOCUMENTATION OF THE EXAMINATION OF INCONEL 600 TUBING FROM STEAM GENERATOR 6B.
J. P. Schmidt, and W. K. Kratzer. 4 Nov 71, 4p

Descriptors: *Boilers, *Hanford production reactors N, *Tubes.

For abstract, see NSA 27 06, number 14285.

DUN-7807 PC$3.00/MF$0.95
Douglas United Nuclear, Inc., Richland, Wash.
CRITICALITY SAFETY ANALYSIS REPORT-HANDLING AND STORAGE OF ENRICHED URANIUM TO 1.25 WEIGHT PERCENT IN DUN FACILITIES 313 AND 3712 BUILDINGS.
R. R. Stickney. 3 Jan 72, 26p

Descriptors: *Criticality, *Uranium.

For abstract, see NSA 27 06, number 12599.

DUN-7988 PC$3.00/MF$0.95
Douglas United Nuclear, Inc., Richland, Wash.
CRITICALITY SAFETY OF URANIUM METAL SCRAP IN MASONRY CONCRETE BILLETS.
H. Toffer. Jun 72, 32p

Descriptors: *Concretes, *Criticality, *Uranium.

For abstract, see NSA 27 06, number 12603.

DUN-8056 PC$3.00/MF$0.95
Douglas United Nuclear, Inc., Richland, Wash.
SETUP AND ADJUSTMENT PROCEDURES FOR THE NON-DESTRUCTIVE TESTERS N FUELS SECTION.
25 Sep 72, 23p

Descriptors: *Hanford production reactors N, *Materials testing/ nondestructive.

For abstract, see NSA 27 06, number 11931.

EUR-4892 PC$3.00/MF$0.95
Kernforschungszentrum, Karlsruhe (West Germany).
FUEL-CLADDING COMPATIBILITY OF STAINLESS STEELS WITH GAS AND SODIUM BONDED URANIUM PLUTONIUM CARBIDE FUELS.
O. Goetzmann, and R. W. Ohse. 1972, 20p
U. S. Sales only

Descriptors: *Plutonium carbides, *Stainless steel, *Uranium carbides.

For abstract, see NSA 27 06, number 12445.

EURFNR-1022 PC$3.00/MF$0.95
Kernforschungszentrum, Karlsruhe (West Germany). Institut Fuer Material Und Festkoerperforschung.
DESIGN, IRRADIATION, AND NONDESTRUCTIVE POST-IRRADIATION EXAMINATION OF UO/SUB 2//PUO/SUB 2/ FUEL PIN BUNDLE DFR-350.
D. Geithoff, and K. Kummerer. May 72, 192p
KFK-1377
Work Performed Under United States--euratom Fast Reactor Exchange Program.

Descriptors: *Reactor fuel elements, *Reactors/ breeder, *Reactors/ fast, *Reactors/ liquid metal-cooled.

For abstract, see NSA 27 06, number 13984.

EURFNR-1024 PC$3.00/MF$0.95
Kernforschungszentrum, Karlsruhe (West Germany). Institut Fuer Reaktorbauelemente.
THEORETICAL STUDIES CONCERNING THE MEASUREMENT OF WALL TEMPERATURES ON SIMULATED FUEL RODS FOR THERMODYNAMICS EXPERIMENTS IN SODIUM.
R. Moeller, and H. Tschoeke. Apr 72, 43p
KFK-1555
Work Performed Under United States--euratom Fast Reactor Exchange Program.

Descriptors: *Reactor fuel elements, *Reactors/ breeder, *Reactors/ fast, *Reactors/ liquid metal-cooled, *Thermocouples.

For abstract, see NSA 27 06, number 13985.

EURFNR-1049 PC$3.00/MF$0.95
Centre D'Etude De L'Energie Nucleaire, Mol (Belgium).
IRRADIATION OF VIBRATED PLUTONIUM RODS IN DIORIT.
H. Schumacher, L. Aerts, H. Bairiot, K. Bischoff, and J. Peter. Aug 72, 56p BLG-469, BN-7208-1
EIR--213
Work Performed Under United States-euratom Fast Reactor Exchange Program. U. S. Sales only

Descriptors: *Plutonium oxides puor, *Reactor fuel elements, *Uranium oxides uor.

For abstract, see NSA 27 06, number 14293.

FEI-273 PC$3.00/MF$0.95
Gosudarstvennyi Komitet Po Ispol'Zovaniyu Atomnoi Energii Sssr, Obninsk. Fiziko-Energeticheskii Institut.
INVESTIGATION OF THE DISTRIBUTION OF CAVITIES OVER THE PERIMETER OF X18H9T STEEL FUEL ELEMENT CANS OF THE BR-5 REACTOR.
V. F. Rentov, K. G. Farkhutdinov, and A. Ya. Ladygin. 1972, 10p
U. S. Sales only

Descriptors: *Reactors/ research.

For abstract, see NSA 27 06, number 14255.

GERHTR-15 PC$3.00/MF$0.95
Kernforschungsanlage, Juelich (West Germany). Institut Fuer Reaktorentwicklung.
INVESTIGATIONS ON THE DIFFUSION OF METALLIC FISSION PRODUCTS AND THE HEAVY METALS IN THE COATINGS OF FUEL PARTICLES FOR HIGH-TEMPERATURE REACTORS.
Juergen Engelhard. 146p
Work Performed Under United States--german High Temperature Reactor Research Exchange Program.

Descriptors: *Fission products, *Reactor fuels, *Reactors/ gas-cooled.

For abstract, see NSA 27 06, number 13987.

GERHTR-3 PC$3.00/MF$0.95
Kernforschungsanlage, Juelich (West Germany). Institut Fuer Reaktorwerkstoffe.
PROCESS FOR THE IDENTIFICATION OF SPHERICAL FUEL ELEMENTS OF THE HIGH-TEMPERATURE REACTOR BY MEANS OF EMISSION SPECTRUM ANALYSIS AT 40 ATM HELIUM.
P. R. Lingen. 104p
Thesis.

Descriptors: *Reactor fuels, *Reactors/ gas-cooled, *Reactors/ pebble-bed.

For abstract, see NSA 27 06, number 13986.

GERHTR-39 PC$3.00/MF$0.95
Kernforschungsanlage, Juelich (West Germany). Inst. Fuer Chemische Technologie.
REPROCESSING OF THORIUM-CONTAINING NUCLEAR FUELS. ACTIVITIES REPORT FOR THE FIRST SIX MONTHS OF 1969.
Aug 69, 92p
Work Performed Under United States--german High Temperature Reactor Research Exchange Program.

Descriptors: *Graphite, *Protactinium, *Radiochemical processing plants, *Reactor fuel elements, *Reactor fuels, *Solvent extraction processes, *Thorex process, *Uranium.

For abstract, see NSA 27 06, number 11884.

GERHTR-41 PC$3.00/MF$0.95
Kernforschungsanlage, Juelich (West Germany). Institut Fuer Chemische Technologie.
REPROCESSING OF THORIUM-CONTAINING NUCLEAR FUELS. ACTIVITIES REPORT FOR THE SECOND HALF YEAR 1969.
Feb 70, 68p
Work Performed Under United States--german High Temperature Reactor Research Exchange Program.

Descriptors: *Graphite, *Protactinium, *Radioactive materials, *Radioactive waste, *Reactor fuel elements, *Reactor fuels, *Thorex process, *Thorium, *Uranium.

For abstract, see NSA 27 06, number 11885.

GERHTR-43 PC$3.00/MF$0.95
Kernforschungsanlage, Juelich (West Germany). Institut Fuer Chemische Technologie.
REPROCESSING OF THORIUM-CONTAINING NUCLEAR FUELS. ACTIVITIES REPORT FOR THE SECOND HALF YEAR 1970.
Feb 71, 129p
Work Performed Under United States–german High Temperature Reactor Research Exchange Program.

Descriptors: *Hot cells, *Protactinium, *Radioactive waste, *Radiochemical processing plants, *Reactor fuel elements, *Reactor fuels, *Thorex process, *Thorium, *Uranium.

For abstract, see NSA 27 06, number 11886.

GU-5285 PC$3.00/MF$0.95
Gulf United Nuclear Fuels Corp., Elmsford, N. Y.
PROOF TEST FACILITY- EXPERIMENTS AND ANALYSIS. DRESDEN PLUTONIUM DEMONSTRATION PROGRAM.
P. K. Doshi, and W. Brooks. Oct 72, 46p
Contract AT (11-1)-2210

Descriptors: *Proof test facility, *Reactor fuel elements, *Reactors/ boiling.

For abstract, see NSA 27 06, number 14257.

GULF-GA-A-12081 PC$3.00/MF$0.95
Gulf General Atomic Co., San Diego, Calif.
STABILITY OF IRRADIATED COATED-PARTICLE FUELS IN A TEMPERATURE GRADIENT.
C. B. Scott, and O. M. Stansfield. 18 Sep 72, 35p
Contract AT (04-3)-167

Descriptors: *Neutrons/ fast, *Reactor fuel elements, *Reactors/ gas-cooled, *Reactors/ power.

For abstract, see NSA 27 06, number 13988.

GULF-GA-A-12285 PC$3.00/MF$0.95
Gulf General Atomic Co., San Diego, Calif.
FLUIDIZED-BED COMBUSTORS USED IN HTGR FUEL REPROCESSING.
B. J. Baxter, L. H. Brooks, A. E. Hutton, M. E. Spaeth, and R. D. Zimmerman. Oct 72, 17p
CONF-721056-1
Contract AT (04-3)-167
From 3. International Conference On Fluidized Bed Combustion- College Corner, Oh (29 Oct 1972).

Descriptors: *Fluidized beds, *Reactor fuel elements, *Reactors/ gas-cooled.

For abstract, see NSA 27 06, number 11887.

GULF-GA-A-12379 PC$3.00/MF$0.95
Gulf General Atomic Co., San Diego, Calif.
VOLATILE FISSION-PRODUCT MIGRATION AND PLATEOUT IN GCFR FUEL-ROD IRRADIATIONS.
S. Langer, N. L. Baldwin, R. J. Campana, J. R. Lindgren, and R. Bono. 8 Nov 72, 34p
Contract AT (04-3)-167

Descriptors: *Fission products, *Reactor fuel elements, *Reactors/ breeder, *Reactors/ fast, *Reactors/ gas-cooled.

For abstract, see NSA 27 06, number 13989.

HEDL-TME-72-128 PC$3.00/MF$0.95
Hanford Engineering Development Lab., Richland, Wash.
USER'S GUIDE FOR GAPCON- A COMPUTER PROGRAM TO PREDICT FUEL-TO-CLADDING HEAT TRANSFER COEFFICIENTS IN OXIDE FUEL PINS.
G. R. Horn, and F. E. Panisko. Sep 72, 75p
Contract AT (45-1)-2170

Descriptors: *Computer programs, *Reactor fuel elements.

For abstract, see NSA 27 06, number 14295.

INR-F-989 PC$3.00/MF$0.95
Institute Of Nuclear Research, Warsaw (Poland).
CLADDING TEMPERATURE MEASUREMENTS OF THE WWR-SM TYPE FUEL ELEMENTS IN EWA-10 CORE.
M. Czerniewski, and L. Labno. 1968, 34p
U. S. Sales only

Descriptors: *Reactors/ research.

For abstract, see NSA 27 06, number 14265.

KFK-1450 PC$3.00/MF$0.95
Kernforschungszentrum, Karlsruhe (West Germany). Institut Fuer Material- Und Festkoerperforschung.
HIGH TEMPERATURE EMBRITTLEMENT.
K. D. Closs. Jul 72, 28p
Lang- In German. U. S. Sales only

Descriptors: *Helium, *Neutrons/ pile, *Stainless steel.

For abstract, see NSA 27 06, number 12557.

LA-3366 (REV.) PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
CRITICALITY CONTROL IN OPERATIONS WITH FISSILE MATERIAL.
H. C. Paxton. Nov 72, 68p
Contract W-7405-ENG-36

Descriptors: *Criticality, *Plutonium isotopes pu-9, *Uranium isotopes u-, *Uranium isotopes u-5.

For abstract, see NSA 27 06, number 12600.

LA-5064 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
ANALYTICAL METHODS FOR FISSIONABLE MATERIALS IN THE NUCLEAR FUEL CYCLE. PROGRAM STATUS REPORT, JUNE 1971--JUNE 1972.
G. R. Waterbury. Oct 72, 9p
Contract W-7405-ENG-36

Descriptors: *Plutonium isotopes pu-9, *Sf materials accounting, *Uranium isotopes u-5.

For abstract, see NSA 27 06, number 12591.

LA-5078 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
APPLICATION OF THE RANDOM SOURCE INTERROGATION SYSTEM (RANDOM DRIVER) AT THE OAK RIDGE Y-12 PLANT. PRELIMINARY RESULTS.
J. E. Foley. Nov 72, 7p
Contract W-7405-ENG-36

Descriptors: *Nuclear materials management, *Uranium, *Uranium isotopes u-5.

For abstract, see NSA 27 06, number 12592.

NP-19599 PC$3.00/MF$0.95
United Kingdom Atomic Energy Authority, Dounreay (Scotland). Reactor Group.
FISSION PRODUCT DISTRIBUTION IN FAST REACTOR OXIDE FUELS.
H. J. Powell. 1970, 16p
U. S. Sales only

Descriptors: *Prototype fast reactor.

For abstract, see NSA 27 06, number 13990.

N73-16254 PC$7.75/MF$0.95
Scripta Technica, Inc., Washington, D.C.
CONDENSATION OF THE GAS PHASE OF A FAST-FLOWING ONE-COMPONENT LIQUID METAL DROPLET GAS MIXTURE.
U. Michel. Feb 72, 113p NASA-TT-F-14609, DLR-FB-72-01
Contract NASW-2036
Tran- Transl. Into English From the German Report Dlr-fb-72-01

Descriptors: *Condensers (liquifiers), *Gas cooling, *Gas flow, *Heat exchangers, Cooling systems, Magnetohydrodynamics, Potassium, Thermodynamic properties.

For abstract, see STAR 11 07.

N73-16638 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
THEORETICAL ANALYSIS OF SWELLING CHARACTERISTICS OF CYLINDRICAL URANIUM DIOXIDE FUEL PINS WITH A NIOBIUM - 1-PERCENT-ZIRCONIUM CLAD.
J. F. Saltsman. Feb 73, 45p NASA-TM-X-2717, E-7135

Descriptors: *Cladding, *Nuclear fuel elements, *Stress analysis, *Swelling, Cylindrical bodies, Niobium alloys, Thermal expansion, Uranium oxides, Zirconium alloys.

For abstract, see STAR 11 07.

N73-16642 PC$3.75/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
POST IMPACT BEHAVIOR OF MOBILE REACTOR CORE CONTAINMENT SYSTEMS.
R. L. Puthoff, W. G. Parker, and L. E. Vanbibber. 1972, 31p NASA-TM-X-68176, L-6283
Conf- Presented At the Ann. Meeting of the Am. Nucl. Soc., Las Vegas, Nev., 18-22 Jun. 1972

Descriptors: *Impact resistance, *Reactor cores, Computer programs, Fission products, Heat sources, Heat transfer, Nuclear propelled aircraft.

For abstract, see STAR 11 07.

ORNL-TM-3777 PC$3.00/MF$0.95
Oak Ridge National Lab., Tenn.
HEAT TRANSFER SALT FOR HIGH TEMPERATURE STEAM GENERATION.
E. G. Bohlmann. Dec 72, 44p
Contract W-7405-ENG-26

Descriptors: *Molten salt breeder reactor, *Potassium nitrates, *Sodium nitrates, *Sodium nitrites.

For abstract, see NSA 27 06, number 13973.

ORNL-TM-3852 PC$3.00/MF$0.95
Oak Ridge National Lab., Tenn.
COST PENALTIES ASSOCIATED WITH CROSS-MIXING OF HTGR PARTICLE TYPES DURING FUEL REPROCESSING.
L. L. Bennett, and W. E. Thomas. Dec 72, 21p
Contract W-7405-ENG-26

Descriptors: *Reactors/ gas-cooled, *Thorium isotopes th-, *Uranium isotopes u-.

For abstract, see NSA 27 06, number 14026.

ORNL-TM-3978 PC$3.00/MF$0.95
Oak Ridge National Lab., Tenn.
PROCESS REQUIREMENTS FOR PREPARING THO/SUB 2/ SPHERES BY THE ORNL SOL--GEL PROCESS.
P. A. Haas. Dec 72, 38p
Contract W-7405-ENG-26

Descriptors: *Sol-gel process, *Thorium oxides thor.

For abstract, see NSA 27 06, number 12399.

ORNL-4825 PC$3.00/MF$0.95
Oak Ridge National Lab., Tenn.
FMODEL- A FORTRAN IV COMPUTER CODE TO PREDICT IN-REACTOR BEHAVIOR OF LMFBR FUEL PINS.
F. J. Homan, W. J. Lackey, and C. M. Cox. Jan 73, 104p
Contract W-7405-ENG-26

Descriptors: *Computer programs, *Liquid metal fast breeder reactor, *Reactor fuel elements.

For abstract, see NSA 27 06, number 13992.

ORO-3508-8 PC$3.00/MF$0.95
North Carolina State Univ., Raleigh. Dept. Of Nuclear Engineering.
DIFFUSION OF GASES IN SOLIDS- TRITIUM DIFFUSION IN REACTOR CLADDING MATERIALS- XENON DIFFUSION IN URANIUM DIOXIDE. PERIOD COVERED-NOVEMBER 1, 1971-OCTOBER 31, 1972.
P. M. Abraham, John Austin, John Davis, Eugene Driscoll, and Kenneth Starr. 1972, 66p
Contract AT (40-1)-3508

Descriptors: *Stainless steel, *Tritium, *Uranium oxides uor, *Xenon, *Zircaloy- .

For abstract, see NSA 27 06, number 12478.

PNCT-831-72-1 PC$3.00/MF$0.95
Power Reactor And Nuclear Fuel Development Corp., Tokai (Japan).
TOKAI WORKS SEMIANNUAL PROGRESS REPORT, JANUARY-JUNE 1971.
Apr 72, 194p
U. S. Sales only

Descriptors: *Cerium isotopes ce-144, *Japanese experimental fast reactor, *Membrane filters, *Plutonium oxides puor, *Radiation detectors, *Reactor fuel elements, *Reactor fuels, *Reactors/ boiling, *Reactors/ pressurized-water, *Strontium isotopes sr-9 , *Uranium isotopes u- 5, *Uranium oxides uor.

For abstract, see NSA 27 06, number 13993.

RD/B/N-2437 PC$3.00/MF$0.95
Central Electricity Generating Board, Berkeley (England). Berkeley Nuclear Labs.
HELCAL 3- A PROGRAM FOR CALCULATION OF DETAILED CAN AND COOLANT TEMPERATURE DISTRIBUTIONS IN AGR CLUSTERS.
M. H. T. Gatehouse, A. G. Hutton, M. H. Lee, and H. G. Lyall. Oct 72, 28p
U. S. Sales only

Descriptors: *Reactor fuel elements, *Reactors/ agr-type.

For abstract, see NSA 27 06, number 13994.

SRARI-P-135 PC$3.00/MF$0.95
Scientific Research Atomic Reactor Inst., Melekess (Ussr).
INVESTIGATION OF THE ESCAPE OF FISSION FRAGMENTS FROM CERAMIC NUCLEAR FUEL.
B. V. Samsonov, and A. K. Frei. 1972, 22p
U. S. Sales only

Descriptors: *Fission products, *Uranium carbides, *Uranium nitrides, *Uranium oxides uor, *Xenon isotopes xe- , *Xenon isotopes xe- 5, *Xenon isotopes xe- 8.

For abstract, see NSA 27 06, number 14298.

TID-26219 PC$3.00/MF$0.95
United Aircraft Corp., East Hartford, Conn. Research Labs.
SPECTRAL ABSORPTION COEFFICIENTS OF ARGON AND SILICON AND SPECTRAL REFLECTIVITY OF ALUMINUM.
N. L. Krascella. Sep 72, 53p L-910904-3
Contract SNPC-70

Descriptors: *Aluminum, *Argon, *Reactors/ gas-fueled, *Reactors/ rocket, *Silicon.

For abstract, see NSA 27 06, number 14239.

UJV-2879-M PC$3.00/MF$0.95
Ceskoslovenska Akademie Ved, Rez. Ustav Jaderneho Vyzkumu.
TRANSFER PHENOMENA IN OXIDE SYSTEMS OF NUCLEAR FUELS.
Jaroslav Klima. 1971, 44p
Lang- In Czech. U. S. Sales only

Descriptors: *Fission products, *Plutonium oxides puor, *Reactors/ fast, *Uranium oxides uor.

For abstract, see NSA 27 06, number 14299.

UJV-2887-R PC$3.00/MF$0.95
Ceskoslovenska Akademie Ved, Rez. Ustav Jaderneho Vyzkumu.
HEAT TRANSFER IN TURBULENT LONGITUDINAL FLOW THROUGH UNBAFFLED ASSEMBLIES OF FUEL RODS.
J. Pfann. 1972, 33p
Lang- In Czech. U. S. Sales only

Descriptors: *Reactor fuel elements.

For abstract, see NSA 27 06, number 14321.

WASH-1236 PC$3.00/MF$0.95
Atomic Energy Commission, Washington, D. C.
TECHNICAL REPORT ON DENSIFICATION OF LIGHT WATER REACTOR FUELS.
14 Nov 72, 167p

Descriptors: *Reactors/ boiling, *Reactors/ pressurized-water, *Reactors/ water-cooled, *Uranium oxides uor.

For abstract, see NSA 27 06, number 13995.

18K. Reactor Physics

AD-757 496 PC$3.00/MF$0.95
Texas Univ Austin Electronics Research Center
IDENTIFICATION OF THERMAL FEEDBACK PARAMETERS FOR A TRIGA MARK-I REACTOR.
Technical memo.,
David Martin Williams, and R. H. Flake. 30 Nov 72, 59p Rept no. TM-36 AFOSR-TR-72-2405
Contract F44620-71-C-0091

Descriptors: (*Research reactors, *Reactor reactivity), Reactor control, Reactor kinetics, Transfer functions, Nonlinear systems, Control rods, Mathematical models, Numerical analysis, Reactor poisons, Identification systems, Computer programs, Feedback.
Identifiers: TRIGA reactors, Parameter estimation, Control theory, Digital filters.

An identification procedure is given for determining the thermal feedback parameters for the TRIGA Mark-I nuclear reactor at The University of Texas at Austin. A discussion of reactivity feedback for heterogeneous reactors is presented. The reactor model, including both thermal and poisoning feedback loops, is developed and then simplified. A brief description is given of the TRIGA reactor and the rest of the experimental equipment. The parameter identification technique is illustrated for the transfer function relating fuel temperature and reactor power level. The design of the two digital filters that are used is also discussed. The reactor system is simulated using the identified parameters. The close match between the simulated results and the measured data indicates that the reactor model is valid for the power regions involved in this experiment. (Author)

AEEW-R-814 PC$3.00/MF$0.95
Atomic Energy Establishment, Winfrith (England).
COMPARATIVE STUDY OF VARIOUS LIGHT WATER SCATTERING MODELS USED IN THERMAL REACTOR CALCULATIONS.
A. T. D. Butland, and C. T. Chudley. Oct 72, 43p
U. S. Sales only

Descriptors: *Neutrons/ thermal, *Reactors/ water-moderated, *Water.

For abstract, see NSA 27 06, number 14311.

ANL-7720 PC$6.00/MF$0.95
Argonne National Lab., Ill.
ARC SYSTEM TWO-DIMENSIONAL ADJUNCT CALCULATIONS.
T. A. Daly, C. G. Stenberg, D. E. Neal, D. A. Schoengold, and G. K. Leaf. Oct 72, 479p
Contract W-31-109-ENG-38

Descriptors: *Computer programs, *Reactors/ fast.

For abstract, see NSA 27 06, number 13944.

CEA-CONF-2076 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Fontenay-Aux-Roses (France). Centre D'Etudes Nucleaires.
DISAGREEMENT BETWEEN THEORETICAL AND EXPERIMENTAL FISSION YIELDS OF NOBLE GASES FOR FAST NEUTRONS- TEST ON THE FUEL OF THE RAPSODIE REACTOR.
B. Kryger. 1970, 9p CONF-720843-4
Lang- In French. From Panel On The Behaviour And Chemical State Of Fission Products In Irradiated Fuel- Vienna, Austria (7 Aug 1972). U. S. Sales only

Descriptors: *Cadarache reactors RAPSODIE, *Fission products, *Plutonium oxides puor, *Reactor fuel elements, *Uranium oxides uor.

For abstract, see NSA 27 06, number 14251.

EUR-4861 PC$3.00/MF$0.95
European Atomic Energy Community, Ispra (Italy). Joint Nuclear Research Center.
PULSED SOURCE EXPERIMENTS WITH HEAVY WATER MODERATED NATURAL URANIUM LATTICES IN EXPO AND ECO.
G. Birkhoff, L. Bondar, W. Hage, and J. Ley. Oct 72, 38p
U. S. Sales only

Descriptors: *Critical assemblies, *Exponential piles.

For abstract, see NSA 27 06, number 14253.

EURFNR-1019 PC$3.00/MF$0.95
Kernforschungszentrum, Karlsruhe (West Germany). Institut Fuer Neutronenphysik Und Reaktortechnik.
ANISOTROPIC DIFFUSION IN GAS-COOLED FAST BREEDER REACTORS.
E. Eisemann. Mar 72, 146p KFK-1577
Work Performed Under United States--euratom Fast Reactor Exchange Program.

Descriptors: *Neutrons, *Reactors/ breeder, *Reactors/ fast, *Reactors/ gas-cooled.

For abstract, see NSA 27 06, number 13946.

EURFNR-1051 PC$3.00/MF$0.95
Centre D'Etude De L'Energie Nucleaire, Brussels (Belgium).
INTERCOMPARISON OF DIFFERENTIAL NEUTRON SPECTROMETRY TECHNIQUES IN THE MOL-SIGMASIGMA FAST ASSEMBLY.
H. Bluhm, G. Fieg, H. Werle, H. Ames, and J. P. Braak. Jul 72, 37p KFK-1658, RCN-172 BLG—471
Work Performed Under United States-euratom Fast Reactor Exchange Program. U. S. Sales only

Descriptors: *Belgian reactor-1, *Neutrons/ fast, *Radiation detectors/ proportional, *Radiation detectors/ semiconductor.

For abstract, see NSA 27 06, number 14254.

FMRB-43/72 PC$3.00/MF$0.95
Physikalisch-Technische Bundesanstalt, Brunswick (West Germany).
ANALYSIS OF THE NEUTRON SPACE IN A REACTOR WITH TWO WEAKLY COUPLED CORES.
Eckart Viehl. Sep 72, 77p
Lang- In German. U. S. Sales only

Descriptors: *Reactors/ research.

For abstract, see NSA 27 06, number 14256.

GULF-RT-B-12154 PC$3.00/MF$0.95
Gulf Radiation Technology, San Diego, Calif.
TIME-OF-FLIGHT SPECTRUM MEASUREMENTS IN THE /SUP 235/U-FUELED FAST SUBCRITICAL REACTORS, STSF-7, -9, AND -10.
J. M. Neill, and J. C. Young. 17 Oct 72, 146p
Contract AT (04-3)-167

Descriptors: *Exponential piles.

For abstract, see NSA 27 06, number 14258.

HEDL-TME-72-118 PC$3.00/MF$0.95
Hanford Engineering Development Lab., Richland, Wash.
CABNED- A COMPUTER CODE TO CALCULATE ABSORBER BURNUP.
G. E. Russcher, and N. J. Graves. Oct 72, 60p
Contract AT (45-1)-2170

Descriptors: *Computer programs, *Reactor control elements.

For abstract, see NSA 27 06, number 14294.

HEDL-TME-72-135 PC$3.00/MF$0.95
Hanford Engineering Development Lab., Richland, Wash.
MULTIGROUP REACTION CROSS SECTIONS FOR FTR APPLICATION.
R. B. Kidman. Oct 72, 41p
Contract AT (45-1)-2170

Descriptors: *Fast test reactor.

For abstract, see NSA 27 06, number 14262.

IAE-2155 PC$3.00/MF$0.95
Institut Atomnoi Energii, Moscow (Ussr).
PROMPT-NEUTRON LIFETIME CALCULATION BY MONTE CARLO.
A. D. Frank-Kamenetskii, and M. S. Yudkevich. 1971, 12p
Lang- In Russian. U. S. Sales only

Descriptors: *Neutrons/ prompt, *Reactors.

For abstract, see NSA 27 06, number 14312.

INR-P-977 PC$3.00/MF$0.95
Institute Of Nuclear Research, Warsaw (Poland).
INVESTIGATION OF THE PHYSICAL PARAMETERS OF THE WWR-SM LATTICES.
L. Adamski, J. Bouzyk, E. T. Jozefowicz, K. Jozefowicz, and K. Kowalska. 1968, 50p
U. S. Sales only

Descriptors: *Reactors/ research.

For abstract, see NSA 27 06, number 14264.

INR-1420 PC$3.00/MF$0.95
Institute Of Nuclear Research, Warsaw (Poland).
ON SOME ADVANTAGEOUS OF THE REACTOR DYNAMICS MODEL WITH POWER FEEDBACK.
Ya. Bouzhik, A. Gadomski, and E. Topa. 1972, 14p
Lang- In Russian. U. S. Sales only

Descriptors: *Reactors/ research.

For abstract, see NSA 27 06, number 14314.

INR-534 PC$3.00/MF$0.95
Institute Of Nuclear Research, Warsaw (Poland).
SPACE-ENERGY THERMAL NEUTRON DISTRIBUTION IN THE REACTOR CELL.
J. Arkuszewski, and T. Kulikowska. Jul 64, 19p
U. S. Sales only

Descriptors: *Critical assemblies, *Neutrons/ thermal, *Reactors.

For abstract, see NSA 27 06, number 14313.

INR-659 PC$3.00/MF$0.95
Institute Of Nuclear Research, Warsaw (Poland).
HELENA CODES FOR MATERIAL BUCKLING DETERMINATION IN SUBCRITICAL ASSEMBLIES.
Cyryl Dabrowski, and A. T. Mikulski. Oct 65, 94p
U. S. Sales only

Descriptors: *Computer programs, *Exponential piles.

For abstract, see NSA 27 06, number 14263.

KFK-1258 PC$3.00/MF$0.95
Kernforschungszentrum, Karlsruhe (West Germany). Institut Fuer Neutronenphysik Und Reaktortechnik.
PROGRAM FOR CALCULATION OF NEUTRON FLUX IN A ONE DIMENSIONAL, CONSISTENT P1-APPROXIMATION FOR MANY ENERGY GROUPS.
D. Sanitz. Aug 72, 58p
Lang- In German. U. S. Sales only

Descriptors: *Computer programs, *Neutrons.

For abstract, see NSA 27 06, number 13383.

KFK-1650 PC$3.00/MF$0.95
Kernforschungszentrum, Karlsruhe (West Germany). Institut Fuer Angewandte Systemtechnik Und Reaktorphysik.
KINETICS EQUATIONS FOR FAST REACTORS.
P. F. Zweifel. Jul 72, 18p
U. S. Sales only

Descriptors: *Reactors/ fast.

For abstract, see NSA 27 06, number 14315.

KR-147 PC$3.00/MF$0.95
Institutt For Atomenergi, Kjeller (Norway).
RAMONA II- A FORTRAN CODE FOR TRANSIENT ANALYSIS OF BOILING WATER REACTORS.
R. Holt, and J. Rasmussen. Aug 72, 155p
U. S. Sales only

Descriptors: *Computer programs, *Reactors/ boiling.

For abstract, see NSA 27 06, number 13947.

LTH-IR-7207 PC$3.00/MF$0.95
Lund Inst. Of Tech. (Sweden). Div. Of Automatic Control.
MAXIMUM LIKELIHOOD IDENTIFICATION OF SOME LOOPS OF THE HALDEN BOILING WATER REACTOR.
Gustaf Olsson. Mar 72, 125p
U. S. Sales only

Descriptors: *Halden boiling reactor.

For abstract, see NSA 27 06, number 13948.

LTH-IR-7228 PC$3.00/MF$0.95
Lund Inst. Of Tech. (Sweden). Div. Of Automatic Control.
ON THE CONVERGENCE PROPERTIES OF THE GENERALIZED LEAST SQUARES IDENTIFICATION METHOD.
T. Soederstroem. Nov 72, 146p
U. S. Sales only

Descriptors: *Halden boiling reactor, *Mathematics.

For abstract, see NSA 27 06, number 14328.

ORNL-TM-3372 PC$3.00/MF$0.95
Oak Ridge National Lab., Tenn.
SPACE AND ENERGY DEPENDENCE OF REACTOR FLUCTUATION SPECTRA.
J. R. Penland. Nov 72, 148p
Contract W-7405-ENG-26
Thesis.

Descriptors: *Reactors.

For abstract, see NSA 27 06, number 14316.

ORNL-TM-3963 PC$3.00/MF$0.95
Oak Ridge National Lab., Tenn.
ZERO-POWER EXPERIMENTS WITH /SUP 233/U IN THE MSRE.
J. R. Engel, and B. E. Prince. Dec 72, 60p
Contract W-7405-ENG-26

Descriptors: *Molten salt reactor experiment.

For abstract, see NSA 27 06, number 13950.

RT/FI- (72)26 PC$3.00/MF$0.95
Comitato Nazionale Per L'Energia Nucleare, Rome (Italy).
KINE-2- A KINETIC CODE IN TWO-DIMENSION.
G. Buffoni, G. Conforto, P. D'amico, A. Galati, and R. Mosiello. 11 Jul 72, 17p
Lang- In Italian. U. S. Sales only

Descriptors: *Computer programs, *Reactors.

For abstract, see NSA 27 06, number 14317.

ZJE-125 PC$3.00/MF$0.95
Skoda Works, Pilsen (Czechoslovakia). Nuclear Power Construction Dept.
SR-OA REACTOR FIRST CRITICAL EXPERIMENT.
K. Dach, J. Fleischhans, Z. Hrdlicka, J. Kott, and J. Nemec. 1972, 17p
U. S. Sales only

Descriptors: *Critical assemblies.

For abstract, see NSA 27 06, number 14270.

18L. Reactors (Power)

BMBW-FBK-72-16 PC$6.00/MF$0.95
Internationale Atomreaktorbau G.m.b.h., Bensberg (West Germany). Siemens A.g.- Erlangen (West Germany).
DEVELOPMENT OF A 300 MWE PROTOTYPE NUCLEAR POWER STATION WITH SODIUM COOLED FAST REACTOR SNR. FINAL REPORT.
Sep 72, 303p
Lang- In German. U. S. Sales only

Descriptors: *Snr reactor.

For abstract, see NSA 27 06, number 13936.

18M. Reactors (Non-Power)

LA-TR-72-29 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Neutron Physics.
IBR-2 PULSED REACTOR AS A SOURCE OF NEUTRONS.
Yu. S. Yazvitskii. 22p

Descriptors: *Reactors/ research.

For abstract, see NSA 27 06, number 14266.

NP-19618 PC$3.00/MF$0.95
Centre D'Etude De L'Energie Nucleaire, Mol (Belgium).
STUDY CENTER OF NUCLEAR ENERGY ANNUAL REPORT 1971.
31 Mar 72, 39p
Lang- In French. U. S. Sales only

Descriptors: *Belgian reactor-2, *Belgium, *Reactors/ fast, *Reactors/ thermal.

For abstract, see NSA 27 06, number 13991.

SC-RR-720861 PC$3.00/MF$0.95
Sandia Labs., Albuquerque, N. Mex.
REFLECTOR BURST EXPERIMENT WITH SPR-II.
T. R. Schmidt, and J. A. Reuscher. Nov 72, 27p

Descriptors: *Reactor control elements, *Sandia pulsed reactor ii.

For abstract, see NSA 27 06, number 14268.

18N. SNAP Technology

TRW-2617-3 PC$3.00/MF$0.95
Trw Systems Group, Redondo Beach, Calif.
TRANSIT RTG. FINAL REPORT. PROGRAM REPORT NUMBER 4.
15 Dec 71, 254p
Contract AT (29-2)-2617

Descriptors: *Nuclear auxiliary power systems.

For abstract, see NSA 27 06, number 12257.

19. ORDNANCE

19A. Ammunition, Explosives, and Pyrotechnics

AD-757 151 PC$3.00/MF$0.95
Ballistic Research Labs Aberdeen Proving Ground Md
MULTIPLE FUSING STRATEGIES.
Memorandum rept.,
James R. Moore. Jan 73, 28p Rept no. BRL-MR-2265

Descriptors: (*Time-delay fuzes, Optimization), Projectile trajectories, Detonations, Probability, Numerical analysis.
Identifiers: *Multiple fuzing techniques, Order statistics.

Procedures for deriving the probability that a warhead will detonate in each segment of its trajectory are given for the case in which its trajectory is segmented into m discrete, disjoint segments and a multiple fuzing strategy is used to initiate warhead detonation. These procedures should be useful for studying the properties of complex fuzing systems which can be modeled as multiple fuzing strategies as well as for studying the properties of multiple fuzing strategies themselves. (Author)

AD-757 262 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
DISPOSAL OF CONVENTIONAL WEAPONS BY CONFINED DETONATION.
Master's thesis,
William Craig Young. Dec 72, 46p

Descriptors: (*Explosive materials, Disposal), (*Safety, Explosive materials), Underground structures, Detonations, Containment, Feasibility studies, Test methods, Design, Military facilities, Stainless steel, Theses.
Identifiers: *Ordnance disposal, *Detonation chambers.

A miniature detonation chamber has been designed and manufactured to allow loading, detonation, reloading, and gas sampling without appreciable loss of products or pressure. The actual products of detonation are compared with the theoretical products. From this comparison, a study is made of the effects on the environment from sequential, confined detonation of conventional explosives in an Atomic Energy Commission test site. (Author)

AD-757 278 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
VELOCITY AND PRESSURE EFFECTS ON PROJECTILES DUE TO VARIATION OF IGNITION PARAMETERS.
Master's thesis,
Richard Otis Culver, Jr., and Raymond Michael Burns. Dec 72, 68p

Descriptors: (*Primers, Ignition), (*Small arms ammunition, Primers), Interior ballistics, Charges (Explosive), Pressure, Burning rate, Experimental data, Theses.
Identifiers: Forward primed ammunition, Primer tubes.

The effect of varying the point of ignition of the powder charge within a cartridge case was investigated with respect to both pressure and velocity. By installing a small tube in the base of the cartridge case it was possible to transfer the primer flash to the forward part of the case. Ignition of the powder charge at the top instead of the base gave lower chamber pressures by as much as 6,300 psi and increased muzzle velocity by 35 ft/s. When additional powder was added to obtain the same chamber pressure as a conventionally primed cartridge, muzzle velocities increased by 50 ft/s. When the pressure was brought up past the original level, but kept within normally accepted limits for the 7.62mm NATO round, velocities increased by 100 ft/s over the original load. (Author Modified Abstract)

AD-757 591 Not available NTIS
Explosives Research and Development Establishment Waltham Abbey (England)
THE ACP TUBE: INITIATION OF DETONATION WITHOUT THE USE OF PRIMARY EXPLOSIVES.
Technical rept.,
A. J. Dedman, and A. L. Lovecy. Jan 73, 9p Rept no. ERDE-TR-46 DRIC-BR-34266
Availability: Pub. in Explosivstoffe, n3/4 p19, 64-68 1971.

Descriptors: (*Explosive materials, Detonations), TNT, PETN, RDX, Ignition, Exploding wires, Shock (Mechanics), Reaction kinetics, West Germany.
Identifiers: ACP (Augmented by Collision Pressure), Augmented by collision pressure, Secondary explosives.

By the application of dynamic principles, the reaction-zone of a secondary explosive can be subjected to an impulsive rise of pressure leading to detonation within tens of microseconds. This ACP method has practical advantages of simplicity and reliability when compared with exploding bridgewires and the known procedures for burning to detonation.

AD-757 634 PC$3.00/MF$0.95
Ballistic Research Labs Aberdeen Proving Ground Md
BURNING RATE STUDIES ON THE CLOSED CHAMBER COMBUSTION OF A FUEL AIR PROPELLANT.
Memorandum rept. (Final),
John D. Knapton, and Irvin C. Stobie. Feb 73, 39p Rept no. BRL-MR-2273

Descriptors: (*Liquid gun propellants, *Burning rate), Spark ignition, Fuel injection, Specific heat, Combustion, Volumetric analysis, Adiabatic gas flow, Pressure.
Identifiers: Fuel air propellants, JP-4 fuel.

Closed chamber studies were performed on the combustion of the fuel air propellant JP4 and air. Densities of loading were varied from 0.18 to 0.36 gm/cubic centimeters. Equivalence ratios were varied from 0.6 to 2.7 fuel to air. A method for calculating the effective burning rate is presented. It was found that a wide variation in the actual burning rate can be obtained depending, approximately, on the inverse of the fuel air mixing time and, to a lesser extent, on the equivalence ratio. The pressure-time data is used to interpret the pressure rise predicted by an isothermal model, an adiabatic model, a reduced pressure model, and a volumetric model. Comparison of the results demonstrated that the reduced pressure model and the volumetric model offer the best pressure-time correlation. (Author Modified Abstract)

AD-757 657 PC$3.00/MF$0.95
Naval Ordnance Lab White Oak Md
DYNAMIC MEASUREMENTS OF DETONATOR OUTPUT,
N. L. Coleburn, T. P. Liddiard, and L. A. Roslund. 29 Jan 73, 41p Rept no. NOLTR-72-266

Descriptors: (*Detonators, Explosion effects), Explosive trains, Boosters, Shock waves, Fragmentation, Underwater, Explosion gases, Electrical properties.
Identifiers: M-84 detonators, Evaluation.

Various techniques for possible use in evaluating dynamic detonator output were investigated. High-speed cameras were used in detonator test firings to record the motion of detonator fragments, explosion gases, shocks in air and in water, and build-up to detonation in boosters. The M84 detonator fired in air has an initial case expansion velocity of 1560 meters/second and an initial explosion gas expansion velocity of 2620 meters/second. The peak shock pressure transmitted into water by the M84 is 46.2 kilobars. Each evaluation technique offers distinct advantages. However, measurements of underwater shock pressures and booster response appear likely to provide the best level of cost effectiveness. (Author Modified Abstract)

AD-757 662 PC$3.00/MF$0.95
Naval Ammunition Depot Crane Ind

ISOLATION AND DISPOSAL OF CHEMICAL INGREDIENTS UTILIZED IN ILLUMINATING FLARES,
Kenneth A. Musselman. Jan 73, 43p Rept no. NAD-CR-RDTR-217

Descriptors: (*Flares, Disposal), Combustion, Air pollution, Magnetsium, Nitrates, Solvent extraction, Recovery.
Identifiers: *Waste disposal, *Materials recovery.

A common method of disposing of waste materials resulting from the production of illuminating flares is to burn them in a burning pit. This adds pollutants in the form of smoke and toxic or noxious fumes. To eliminate this source of pollution, a relatively facile scheme for isolating and reclaiming the magnesium and for the disposal of the sodium nitrate and binder residues from waste flare compositions has been developed. This scheme involves washing the flare compositions with water, and in some instances with acetone or other solvents, to remove sodium nitrate and most of the binder material. The remaining magnesium is dried and prepared for sale as scrap or for use in the production of new flares. Luminous intensity data, collected on prototype flares utilizing the reclaimed magnesium, suggest that reuse of the unadulterated material in illuminating composition production may not be feasible. Sodium nitrate, aqueous solution, is being evaluated for its nutrient value as a fertilizer and the intractable, infrangible binder is sent to land-fill. (Author)

AD-757 663 PC$3.00/MF$0.95
Denver Research Inst Colo Mechanics Div
SPECTRAL DISTRIBUTION OF DIFFERENT REGIONS OF ILLUMINATING FLARE FLAMES.
Final rept. 5 May 71-11 Jul 72,
Robert M. Blunt. 1 Dec 72, 57p Rept no. DRI-4624-7210-F NAD-CR-RDTR-220
Contract N00164-71-C-0348

Descriptors: (*Flares, Illumination), (*Flames, Intensity), Sodium, Magnesium, Photographs, Spectroscopy.
Identifiers: *Spectral intensity.

The flames of illuminating flame compositions which contained either the stoichiometric proportions of NaNO and Mg, or an excess of Mg, were examined at ambient pressures of 630, 150, 30 and 6 torr. The apparatus was arranged to obtain simultaneously a photograph of the flame and a spectrum from a region identifiable in the photograph. Changes in the intensity distribution were observed in the photographs when the ambient pressure was changed which appear to arise from the formation of concentrations of Mg. Sodium did not exhibit local concentration effects. Changes in the spectral intensity distribution at different distances above the candle are also observed. The changes associated with different radial positions are less noticeable. (Author Modified Abstract)

N73-16657 PC$8.50/MF$0.95
Institut Franco-allemand de Recherches, St. Louis (France).
OBTAINMENT OF AN ULTRA-RAPID, DENSE PLASMA STREAM FROM THE EXPLOSION OF A LITHIUM WIRE. APPLICATION TO METEORITES AND IMPACT PHYSICS SIMULATION . SUR LOBTENTION DUN JET ULTRA-RAPIDE DE PLASMA DENSE DEXPLOSION DE FIL DE LITHIUM. APPLICATIONS A LA SIMULATION DES METEORITES ET EN PHYSIQUE DES IMPACTS.
Ph.D. Thesis - Nancy Univ.
G. Herbette. 1 Oct 71, 128p ISL-26/71
Language French

Descriptors: *Exploding wires, *Hypervelocity impact, *Meteoritic damage, *Plasma accelerators, Electrothermal engines, Hypervelocity projectiles, Impact tests, Micrometeorites, Plasma jets.

For abstract, see STAR 11 07.

N73-16658 PC$3.00/MF$0.95
Institut Franco-allemand de Recherches, St. Louis (France).
STUDY OF THE SENSITIVITY OF NITROGLYCERIN TO WEAK SHOCK WAVES (SUPERSONIC AIRCRAFT BANGS) . UNTERSUCHUNG DER EMPFINDLICHKEIT VON NITROGLYCERIN GEGEN SCHWACHE STOSSWELLEN (FLUGZEUGKNALL).
H. W. Koch, I. Bischoff, and L. Philipp. 27 Apr 72, 19p ISL-14/72
Language German

Descriptors: *Detonation, *Nitroglycerin, *Shock resistance, *Sonic booms, Explosives, Primers (explosives), Shock tests, Shock wave generators, Shock wave propagation.

For abstract, see STAR 11 07.

19B. Bombs

AD-757 658 PC$3.00/MF$0.95
Naval Ordnance Lab White Oak Md
THE STATIC AND MAGNUS AERODYNAMIC CHARACTERISTICS OF THE M823 RESEARCH STORE EQUIPPED WITH FIXED AND FREELY SPINNING STABILIZERS,
Frank J. Regan, and Mary E. Falusi. 1 Dec 72, 159p Rept no. NOLTR-72-291

Descriptors: (*Spin-stabilized ammunition, Magnus force), Free fall models, Bomb fins, Spin stabilization, Wind tunnel models, Angle of attack, Aerodynamic loading, Transonic characteristics.
Identifiers: M-823 bombs.

The report is the first in a two-part series of technical reports on the dynamics and aerodynamics of free-fall stores using freely spinning stabilizers. Presented are the results of recent wind-tunnel measurements of the normal force, pitching moment and Magnus force and moment on the M823 Research Store in transonic flow. Comparisons are made between configurations equipped with fixed and freely spinning stabilizers, with regard to sign and relative magnitude of the Magnus force and moment. A method is presented and applied whereby the Magnus force and moment are corrected for flow angularity. (Author)

19C. Combat Vehicles

AD-757 170 PC$3.00/MF$0.95
Human Engineering Lab Aberdeen Proving Ground Md
HELAST 1 - A FIELD STUDY OF TARGET PRESENTATION AND DEFENDER REACTION.
Technical memo.,
Andrew J. Eckles, III, Thomas A. Garry, and William C. Mullen. Feb 73, 39p Rept no. HEL-TM-3-73

Descriptors: (*Human engineering, *Tanks (Combat vehicles)), Performance (Human), Target acquisition, Mission profiles, Defense systems, Gunnery, Armament, Simulation.
Identifiers: HELAST (Human Engineering Laboratory Armor Systems Tests), Human engineering laboratory armor systems tests.

Target-presentation data and defender-tank reaction from an Armor Field Test are presented. Although the attack scenarios were conducted on terrain with virtually no vegetative cover, the detection and engagement performance was considered to be less than desired for effective defense. (Author)

19D. Explosions, Ballistics, and Armor

AD-757 183 PC$25.50/MF$0.95
Naval Intelligence Support Center Washington D C Translation Div
DYNAMIC LOADS IN UNDERWATER EXPLOSION,
B. V. Zamyshlyaev, and Yu. S. Yakovlev. 2 Feb 73, 467p Rept no. NISC-Trans-3391
Trans. of mono. Dinamicheskie Nagruzki v Podvodnom Vzryve, Leningrad, Leningrad, 1967 463p.

Descriptors: (*Underwater explosions, *Detonation waves), Explosion bubbles, Shock waves, Cavitation, Boundary value problems, Hydrodynamics, Interactions, USSR.
Identifiers: Translations, *Dynamic loads.

The report contains results of studies relevant to the dynamic response of objects subjected to underwater explosions. The kinetics of detonation waves are mathematically evolved.

AD-757 418 MF$0.95
Boynton Associates La Canada Calif
PROOF TESTING LARGE BLAST LOAD GENERATOR, FIRST PHASE.
Final rept.,
William W. Boynton, James M. Carter, Benedict Cassen, N. D. Whitman, Jr., and James H. Jennison. Jun 63, 152p AEWES-CR-1-128
Contract DA-22-079-eng-338
Availability: Available in microfiche only.

Descriptors: (*Detonations, *Test equipment), Design, Structural parts, Charges (Explosive), Explosive trains, Pressure vessels, Hydrostatic tests.
Identifiers: *Blast load generators.

The report describes the work performed to bring the Large Blast Load Generator to the point where actual test firings in the completely assembled equipment could be undertaken. The areas of major effort were: development of suitable explosive and propellant primary charges, containments and firing trains; assisting in proof testing the individual firing tubes to demonstrate their strength and freedom from flaws; drawing up recommendations for preparations, precautions and operating protocol for the initial test firings; assisting in development of sealing techniques to permit performance of high pressure hydrostatic tests on the pressure vessel; and providing engineering analysis of the hydraulic jack system for the platen rail lift mechanism.

AD-757 456 PC$3.00/MF$0.95
Saclant ASW Research Centre La Spezia (Italy)
A DECONVOLUTION TECHNIQUE FOR THE REMOVAL OF THE BUBBLE PULSE RESPONSE OF UNDERWATER EXPLOSIVE CHARGES USING A SYNTHETIC DIRECT SIGNAL,
Jens M. Hovem. 1 Feb 73, 11p Rept no. SACLANTCEN-SM-3

Descriptors: (*Underwater explosions, Explosion bubbles), (*Underwater sound, Integral transforms), Synthesis, Fourier analysis, Italy.
Identifiers: Signal processing, Fourier transformation, Autocorrelation.

A deconvolution technique for the removal of the bubble pulse response of an underwater explosive source using a synthetic direct signal is presented. The synthetic direct signal is constructed on the basis of an accurate measurement of the actual bubble pulse period of the response signal. The technique can therefore be applied in situations where it is not possible to record the direct signals. Although the method is not perfect, a significant reduction of the bubble pulse response is obtained. (Author)

N73-16225 PC$3.50/MF$0.95
Institut Franco-allemand de Recherches, St. Louis (France).
BULLET RIFLING MEASUREMENTS USING POLARIZED LIGHT . GESCHOSSDRALLMESSUNG MIT POLARISIERTEM LICHT.
R. Meyer, and A. Stenzel. 1972, 30p
BMVG-FBWT-72-18, ISL-T-25/70
Subm- Sponsored By Bundesmin. Fuer Verteidigung

Descriptors: *Light modulation, *Polarized light, *Projectiles, *Rotation, Gas lasers, Incident radiation, Spin.

For abstract, see STAR 11 07.

SC-DR-720523 PC$3.00/MF$0.95
Sandia Labs., Albuquerque, N. Mex.
EMPIRICAL EQUATIONS FOR PREDICTING PENETRATION PERFORMANCE IN LAYERED EARTH MATERIALS FOR COMPLEX PENETRATOR CONFIGURATIONS.
C. W. Young. Dec 72, 65p

Descriptors: *Missiles, *Soils.

For abstract, see NSA 27 06, number 14427.

SC-DR-720877 PC$3.00/MF$0.95
Sandia Labs., Albuquerque, N. Mex.
DRAG COEFFICIENTS OF TANGENT OGIVE NOSE PROJECTILES AFTER VERTICAL WATER ENTRY.
Lewis Thigpen. Dec 72, 28p

Descriptors: *Ordnance materiel.

For abstract, see NSA 27 06, number 14429.

19F. Guns

AD-757 163 PC$3.00/MF$0.95
Army Weapons Command Rock Island Ill Cost Analysis Div
COST ESTIMATING RELATIONSHIPS FOR MANUFACTURING HARDWARE COST OF GUN/HOWITZER CANNONS.
Technical rept.,
Gerald W. Kalal. Aug 72, 19p Rept no. AMSWE-CPE-72-8

Descriptors: (*Howitzers, Costs), Munitions industry, Economics, Production, Statistical data, Regression analysis.
Identifiers: CER (Cost Estimating Relationships), Cost estimating relationships, *Cost analysis.

Cost estimating relationships (CER's) for predicting the in-house manufacturing hardware unit costs for cannons during the early stages of weapon system development are discussed in this study. Physical/Performance characteristics regarded as 'cost drivers', known early in cannon development, were selected as independent variables. Six CER's are presented in order of decreasing 'goodness of fit', and each exhibit a correlation at the one percent level (F-test). (Author)

AD-757 164 PC$3.00/MF$0.95
Army Weapons Command Rock Island Ill Cost Analysis Div
COST ESTIMATING RELATIONSHIPS FOR MANUFACTURING HARDWARE COST OF HOWITZER CARRIAGES AND RECOIL MECHANISMS.
Technical rept.,
Gerald W. Kalal. Sep 72, 17p Rept no. AMSWE-CPE-72-10

Descriptors: (*Recoil mechanisms, Costs), (*Howitzers, *Gun mounts), Munitions industry, Economics, Production, Statistical data, Regression analysis.
Identifiers: CER (Cost Estimating Relationships), Cost estimating relationships, Cost analysis.

Cost estimating relationships (CER's) for predicting the in-house manufacturing hardware unit costs for carriages and recoil mechanisms during the early stages of weapon system development are discussed in this study. Independent variables which were more likely to be known early in development were selected as 'cost drivers'. Four CER's are presented for estimating recoil mechanism unit cost in order of decreasing 'goodness of fit', two CER's are presented for estimating carriage unit cost, and one additional CER is presented for estimating the sum of the recoil mechanism and carriage unit cost. Each of the above CER's exhibit a correlation at a ten percent level (F-test) or better. (Author)

20. PHYSICS

20A. Acoustics

AD-757 034 PC$3.00/MF$0.95
Texas Univ Austin Applied Research Labs
AN EXPERIMENTAL INVESTIGATION OF THE PARAMETRIC ARRAY IN AIR.
Technical rept.,
Mary B. Bennett. 22 Jan 73, 124p Rept no. ARL-TR-73-3
Contracts F44620-71-C-0015, N00014-70-A-0166-0004

Descriptors: (*Sound generators, Acoustic properties), Transducers, Sound signals, Harmonic analysis, Propagation, Experimental design, Computer programs, Theses, Nonlinear systems, Air.
Identifiers: Acoustic arrays, AIRBEAM computer program, AIRPROP computer program, FORTRAN 4 programming language, FORTRAN, Burgers equation, Nonlinear acoustics.

The results of an experimental investigation of the parametric array in air are presented and analyzed. This experiment was designed to yield quantitative data regarding both the propagation and directivity characteristics of the parametric array in air under the conditions of collinear source beams and spherical spreading. The characteristics of the sum frequency and second harmonic components as well as the difference frequency component of the parametric array were investigated.

AD-757 035 PC$3.00/MF$0.95
Texas Univ Austin Applied Research Labs
FOCUSING OF AN N WAVE BY A SPHERICAL MIRROR.
Technical rept.,
Edward P. Cornet. 19 Sep 72, 102p Rept no. ARL-TR-72-40
Contracts N00014-70-A-0166-0004, F44620-71-C-0015

Descriptors: (*Sound signals, Focusing), (*Microphones, Acoustic properties), Transients, Diffraction, Refraction, Wave functions, Experimental design, Theses, Nonlinear systems.
Identifiers: Wave equations, Nonlinear acoustics.

An experimental and theoretical study of N-wave focusing has been carried out. An N-wave source (electric spark) was located on the principal axis of a spherical mirror so as to produce a focus (image point) beyond the center of curvature. The signals before, at, and beyond the focus were received by a wideband condenser microphone of our own manufacture. Linear theory in the form of the Kirchhoff integral was used to obtain predicted waveforms. Corrections for known nonlinear propagation effects were applied. The data are explained adequately by the composite theory. An analysis of the frequency response of the wideband condenser microphone is included. (Author Modified Abstract)

AD-757 036 PC$3.00/MF$0.95
Texas Univ Austin Applied Research Labs
NOMOGRAPHS FOR PARAMETRIC TRANSMITTING ARRAY CALCULATIONS,
James C. Lockwood. 6 Feb 73, 19p Rept no. ARL-TM-73-3
Contract N00024-72-C-1380

Descriptors: (*Underwater sound, Nomographs), Sonar arrays, Sea water, Shock waves.
Identifiers: Acoustic arrays, Far field.

Nomographs for use in evaluating the farfield source level of the parametric transmitting array are presented. (Author Modified Abstract)

AD-757 110 PC$3.00/MF$0.95
Georgia Univ Athens Dept of Physics and Astronomy
CALCULATIONS OF REFLECTED ACOUSTIC FLUX PATTERNS FOR SOUND RAYS ORIGINATING AT THE OCEAN SURFACE AND REFLECTED FROM UNDERWATER OBJECTS.
Final rept. 12 Jun-31 Dec 72,
Donald G. Burkhard, and David L. Shealy. 28 Feb 73, 64p
Contract N00014-67-A-0309-0002

Descriptors: (*Underwater sound, Reflection), Refraction, Sound transmission, Mathematical models, Partial differential equations, Wave functions, Underwater objects.
Identifiers: Ray tracing, Ocean surface.

A formula is derived for the acoustic intensity reflected by an object of arbitrary shape embedded in a medium of variable index of refraction. Formulas are applicable in the ray acoustics limit. As specific applications, contours of equal intensity are calculated over a plane parallel to the ocean surface and over a plane perpendicular to the ocean surface when a plane wave of sound is reflected from ellipsoidal objects at various depths and distances from the receiver planes. (Author)

AD-757 273 PC$3.00/MF$0.95
Tennessee Univ Space Inst Tullahoma
FUNDAMENTAL RESEARCH ON ADVANCED TECHNIQUES FOR SONIC BOOM SUPPRESSION.
Final rept.,
B. H. Geothert, Y. S. Pan, S. N. Chaudhuri, R. Kohl, and H. Gruschka. Nov 72, 200p FAA-RD-73-4
Contract DOT-FA70WA-2260

Descriptors: (*Sonic boom, Reduction), Intensity, Theory, Aerodynamic configurations, Airframes, Wings, Exhaust nozzles, Exhaust gases, Slotted flaps.
Identifiers: Noise reduction.

A multiphase theoretical investigation on predicting and alleviating sonic boom intensity is described. A new theory to predict sonic boom intensity on the ground from wind tunnel tests using normal size models (as opposed to the very small models presently used) was developed. A relatively easy method to determine aircraft contours with desirable finite pressure rise times is presented, as is a method to determine phantom body shapes with desirable pressure rise times which can be simulated by heat addition to the flow upstream of the aircraft. It is shown that a slotted nozzle engine exhaust has the unique capability to shift lift from the solid surface of the wing to the region behind the wing, with a resulting reduction in sonic boom intensity.

AD-757 460 PC$3.00/MF$0.95
Saclant ASW Research Centre La Spezia (Italy)
WAVE PROPAGATION IN RANDOM MEDIA.
Technical rept.,
Leonard Fortuin, G. Arcovito, L. Baekelandt, R. Gastmans, and O. Grenness. 1 Jan 73, 280p Rept no. SACLANTCEN-TR-221
NATO furnished.

Descriptors: (*Underwater sound, Thermal analysis), Reverberation, Differential equations, Statistical processes, Distortion, Diffraction, Reflection, Reflection, Ocean bottom, Thermal properties, Scattering, Microstructure, Correlation techniques, Theorems, Italy.

Sound waves, propagating through the ocean, may be accompanied by surface, bottom and volume reverberation. One of the causes for the volume scattering is the thermal microstructure of the medium. Its effect on wave propagation is discussed in this report, from a theoretical point of view. Sound frequencies from the diffraction domain up into the band where geometrical optics are valid, have been considered. The medium is assumed to be unbounded, homogeneous, stationary and anisotropic, with weak fluctuations in the index of refraction. (Author Modified Abstract)

AD-757 664 PC$3.00/MF$0.95
Naval Underwater Systems Center Newport R I
LOW-FREQUENCY SOUND ATTENUATION IN THE GULF OF ADEN.
Technical rept.,
David G. Browning, Everett N. Jones, and William H. Thorp. 5 Mar 73, 22p Rept no. NUSC-TR-4501

Descriptors: (*Underwater sound, Indian Ocean), Low frequency, Velocity, Salinity, Attenuation, Experimental data, Thermoclines, Correlation techniques.
Identifiers: Aden Gulf.

With the support of the French Navy, a low-frequency sound propagation experiment was conducted to obtain attenuation coefficients in the Gulf of Aden for the frequency range of 200 to 10,000 Hz. The experiment was conducted along a 500-kyd track, which was characterized by a broad sound channel with an axis depth of 250 m. The results are compared with previous measurements in the Red Sea and Atlantic Ocean. The attenuation coefficients agree with previous open ocean sound channel experiments and thus support the conclusion that attenaution for the frequency range of 200 to 10,000 Hz is independent of the experimental site. (Author)

AD-757 682 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
AN ANALYSIS OF ENVIRONMENTAL DATA FOR USE IN UPDATING LOW FREQUENCY PROPAGATION LOSS FORECASTS.
Master's thesis,
Phillip Ivan Harvey. Dec 72, 181p

Descriptors: (*Underwater sound generators, *Sound transmission), (*Antisubmarine warfare, Underwater sound generators), Underwater sound, Propagation, Ocean currents, Transition temperature, Ocean bottom, Hydrophones, Acoustic ranges, Theses.
Identifiers: ASRAP (Acoustic Sensor Range Prediction), Acoustic sensor range prediction, Sea state, Julie acoustic system, Jezebel acoustic system, Thermal gradients.

An acoustic model for low frequency (100-2400 HZ) propagation loss within a surface duct is examined. An analysis of the sensitivity of this model as a function of the governing environmental parameters is performed. The results of this analysis show that the frequency and mixed layer depth are influential over a wide range of environmental conditions and that the below layer thermal gradient becomes important at low frequencies when the layer depth is relatively shallow. Under certain conditions, a change in below layer thermal gradient of 2F/100 FT has the same resultant effect as a 25 FT change in the mixed layer depth. (Author Modified Abstract)

AD-757 698 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
THE CHARACTERIZATION OF ACOUSTIC VARIABILITY IN THE OCEAN.
Technical rept.,
Thomas D. Burnett. Oct 72, 74p Rept no. NPS-55ZA72101A

Descriptors: (*Underwater sound, Attenuation), Ocean waves, Underwater sound equipment, Thermal properties, Sea water, Regression analysis.
Identifiers: Sea states.

The temporal and spacial variation in one-way transmission loss as experienced in the ocean due to short term temporal and small scale spacial variation in the acoustic environment is examined. This variation is characterized as a function of the transmission frequency, transmission range, source and receiver depths, predominant thermal structure and geographical locality. The results obtained clearly indicate that variability in transmission loss is indeed dependent upon the relative position of source and receiver within the acoustic medium as well as the nature of the acoustic medium. Suggestions are made as to the nature of the influences which control this variation. (Author)

N73-16011 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
LOW-FREQUENCY REAR QUADRANT NOISE OF A TURBOJET ENGINE WITH EXHAUST DUCT MUFFLING.
R. P. Woodward, and G. L. Minner. Feb 73, 21p NASA-TM-X-2718, E-7202

Descriptors: *Acoustic measurements, *Acoustic properties, *Engine noise, *J-65 engine, *Sound transmission, Acoustic properties, Jet exhaust, Mufflers, Sound intensity.

For abstract, see STAR 11 07.

N73-16013 PC$3.00/MF$0.95
Mount Auburn Research Associates, Inc., Newton Upper Falls, Mass.
GODUNOV METHOD AND COMPUTER PROGRAM TO DETERMINE THE PRESSURE AND FLOW FIELD ASSOCIATED WITH A SONIC BOOM FOCUS.
L. W. Parker, and R. G. Zalosh. Jan 73, 109p NASA-CR-2127
Contract NAS1-10276

Descriptors: *Computer programs, *Flow distribution, *Sonic booms, *Supersonic speeds, Mathematical models, Numerical analysis, Wave propagation.

For abstract, see STAR 11 07.

N73-16653 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EMISSION OF SOUND FROM TURBULENCE CONVECTED BY A PARALLEL FLOW IN THE PRESENCE OF SOLID BOUNDARIES.
M. E. Goldstein, and B. M. Rosenbaum. Feb 73, 92p NASA-TN-D-7118, E-6932

Descriptors: *Acoustic properties, *Aerodynamic noise, *Sound localization, *Sound transmission, Acoustic measurements, Shear flow, Turbulent flow.

For abstract, see STAR 11 07.

N73-16654 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
NEW ASPECTS OF SUBSONIC AERODYNAMIC NOISE THEORY.
M. E. Goldstein, and W. L. Howes. Feb 73, 40p NASA-TN-D-7158, E-7047

Descriptors: *Acoustic measurements, *Acoustic properties, *Aerodynamic noise, *Jet aircraft noise, Sound localization, Sound transmission, Wave propagation.

For abstract, see STAR 11 07.

N73-16655 PC$3.50/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
THE EFFECT OF NOZZLE INLET SHAPE, LIP THICKNESS, AND EXIT SHAPE AND SIZE ON SUBSONIC JET NOISE.
W. A. Olsen, O. A. Gutierrez, and R. G. Dorsch. 1973, 28p NASA-TM-X-68182, E-7289
Conf- Presented At 11th Aerospace Sci. Meeting, Washington, D. C., 10-12 Jan. 1973 Sponsored By Am. Inst. of Aeron. and Astronaut.

Descriptors: *Aircraft noise, *Noise reduction, *Nozzle geometry, Aerodynamic configurations, Jet aircraft, Noise intensity.

For abstract, see STAR 11 07.

20B. Crystallography

AD-757 588 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
THE GROWTH OF IRON WHISKERS BY THE HIGH TEMPERATURE REDUCTION OF FERROUS HALIDE SALTS.
Master's thesis,
Charles William Jaget. Dec 72, 83p

Descriptors: (*Whiskers (Crystals), Crystal growth), (*Iron, *Crystal growth), Reduction (Chemistry), Iron compounds, Chlorides, Iron oxides, Manufacturing methods, Theses.
Identifiers: Iron chlorides.

The growth mechanism of iron whiskers produced by the hydrogen reduction of iron halide salts was investigated by the variation of a number of parameters. The observations are correlated with current theories and with the thermodynamic behavior of this reaction which indicates that the tip of the growing whisker should be colder than the ambient medium (the cold tip). The mass growth of iron whiskers in the presence of carbon was examined to evaluate the potential of this method to produce marketable whiskers. An unidentified, nonmetallic whisker growth was discovered growing in bone charcoal. Growth was determined to require the presence of a ferrous halide and calcium orthophosphate. Further postulates concerning the cool tip theory are made. (Author)

JINR-E4-6746 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
SCATTERING PROPERTIES OF A NEAREST NEIGHBOUR CLUSTER.
P. Rennert, and P. Ziesche. 1972, 12p
U. S. Sales only

Descriptors: *Alloys, *Crystals, *Metals.

For abstract, see NSA 27 06, number 14389.

PB-216 188/3 PC$3.00/MF$0.95
Geological Survey, Washington, D. C.
INDEXING AND LEAST-SQUARES REFINEMENT OF POWDER DIFFRACTION DATA. (JOB 9214)
Final rept.,
Daniel E. Appleman, and Howard T. Evans, Jr. Feb 73, 65p* USGS Computer Contrib-20, USGS-GD-73-003

Descriptors: (*X-ray diffraction, *Computer programs), (*Lattire parameters, X-ray diffraction), Crystallography, Debye-Scherrer method, Least squares method, Standard error, FORTRAN.
Identifiers: FORTRAN 4 programming language, IBM 360/65 computers, IBM 7090 computers.

A computer technique has been developed for simultaneous cyclic indexing of powder diffraction data and refinement of unit cell dimensions.

The FORTRAN 4 IBM360/65 program accepts as input any combination of indexed and/or unindexed 2-theta or d-values, along with crystal system, extinction criteria and approximate lattice parameters. Calculated and observed peak positions are matched according to predetermined statistical criteria which can be set by the user. Satisfactorily indexed observed peaks are used to compute new lattice parameters by least-squares refinement. Ambiguities of indexing, bad measurements and peaks due to impurities are clearly indicated. Program listings are included. (Author)

20C. Electricity and Magnetism

AD-757 190 PC$3.00/MF$0.95
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
SURFACE CURRENTS ON A CONDUCTING SPHERE DUE TO A NON-ISOTROPIC EMITTED PULSE OF ELECTRONS.
Masters thesis,
James J. Harvey, Jr. Mar 73, 107p Rept no. GA/PH/73-1

Descriptors: (*Electric currents, Spheres), (*Nuclear explosions, *Electromagnetic pulses), X rays, Electromagnetic fields, Blackout (Electromagnetic), Radiation damage, Partial differential equations, Vector analysis, Green's function, Integral equations, Integration, Theses.
Identifiers: Maxwells equations, Numerical integration.

Equations for the surface currents on a perfectly conducting sphere are developed in terms of the motion of a pulse of electrons emitted from the exterior surface of the sphere. The motions of the emitted electrons are determined self-consistently by using Green's function techniques to solve for the electric and magnetic fields in the space surrounding the sphere. The problem assumes that the electrons are emitted non-relativistically with azimuthal symmetry, and that the fields are essentially quasi-static in character. The resulting integral equations are solved using a mixture of analytical and numerical techniques. A specific example is worked out assuming uniform emission over one hemisphere by a delta function pulse of electrons with an energy distribution in the kev range. The results are presented graphically for a variety of emission currents, and it was found that this technique will provide useful results for emission pulse densities below 10 coulombs per square meter. (Author)

BNL-17312 PC$3.00/MF$0.95
Brookhaven National Lab., Upton, N. Y.
PERFORMANCE AND MAGNETIC MEASUREMENTS OF A FULL SCALE CROSS-SECTION MODEL OF A SUPERCONDUCTING 8/SUP 0/ BENDING MAGNET SYSTEM.
J. Allinger, G. Danby, B. Devito, H. Foelsche, and R. Gibbs. 1972, 7p CONF-720908-21
From 4. International Conference On Magnet Technology- Upton, Ny (19 Sep 1972).

Descriptors: *Electromagnetic lenses.

For abstract, see NSA 27 06, number 12678.

BNL-17313 PC$3.00/MF$0.95
Brookhaven National Lab., Upton, N. Y.
STUDIES OF LOSSES, DIAMAGNETIC AND PERMANENT MAGNETIC EFFECTS IN SUPERCONDUCTING MAGNETS.
G. Danby, H. Foelsche, S. Hsieh, J. Jackson, and A. Prodell. 1972, 5p CONF-720908-22
From 4. International Conference On Magnet Technology- Upton, Ny (19 Sep 1972).

Descriptors: *Electromagnetic lenses.

For abstract, see NSA 27 06, number 12679.

JINR-P9-6755 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Problems.
COMPUTATION OF THREE-DIMENSIONAL ELECTROSTATIC FIELDS BY THE GRID METHOD.
S. B. Vorozhtsov. 1972, 12p
Lang- In Russian. U. S. Sales only

Descriptors: *Electrostatic fields.

For abstract, see NSA 27 06, number 12658.

20D. Fluid Mechanics

AD-757 037 Reprint
Massachusetts Inst of Tech Cambridge
HYPERSONIC LEADING EDGE PROBLEM: WEDGES AND CONES,
Michael L. Shorenstein. 17 Feb 72, 7p
Contract N00014-67-A-0204-0040, ARPA Order-322
Revision of report dated 28 Apr 71.
Availability: Pub. in AIAA Jnl., v10 n9 p1173-1179 Sep 72.

Descriptors: (*Leading edge, *Hypersonic characteristics), Wedges, Conical bodies, Viscosity, Flow fields, Shock waves, Equations of motion, Mathematical models.
Identifiers: Zero angle of yaw, Viscous flow.

An analysis is given for the viscous hypersonic flow past slender sharp wedges and unyawed cones. The leading edge or nose region treated encompasses the merged layer regime in which the shock thickness is not small in comparison with the viscous layer thickness but for which in the axisymmetric case the shock thickness is small in comparisen with the radius of transverse shock curvature. A Navier-Stokes flow is assumed, and both the shock structure and viscous layer are taken to be locally-similar of boundary-layer type. The analysis follows that used by Shorenstein and Probstein for the corresponding flat plate problem. For axisymmetric cone flow, a modification of a transformation introduced by Probstein and Elliott is given to reduce the axisymmetric viscous layer equations including transverse curvature to 'exactly' two-dimensional form. Results for the state conditions behind the shock, and the wall pressure and heat-transfer rate are found to be in good agreement with available experimental data. (Author)

AD-757 062 PC$3.00/MF$0.95
Cincinnati Univ Ohio Dept of Aerospace Engineering
SUPERSONIC BOUNDARY-LAYER SEPARATION AND REATTACHMENT-FINITE DIFFERENCE SOLUTIONS.
Final rept.,
Michael J. Werle, Arnold Polak, and Steven D. Bertke. Jan 73, 90p Rept no. AFL-72-12-1
Contract N00019-72-C-0136

Descriptors: (*Supersonic flow, Boundary layer transition), Laminar flow, Turbulence, Shock waves, Two-dimensional flow, Three-dimensional flow, Difference equations, Matrix algebra, Graphics, Heat transfer, Numerical analysis, Flow fields.
Identifiers: *Finite difference theory.

The boundary-layer equations including the effects of interaction with a supersonic mainstream are solved using an implicit finite difference scheme. The free interaction process is studied extensively and favorable comparisons made with experimental data, expirical correlations, and analytical results. Solutions are presented for shockwave and compression ramp induced separations and reattachments for a Mach 3 mainstream at moderate and cold wall temperatures. Surprisingly little overheating is observed aft of reattachment. (Author)

AD-757 075 PC$3.00/MF$0.95
Michigan Univ Ann Arbor Dept of Engineering Mechanics
LASER-DOPPLER ANEMOMETER MEASUREMENTS OF TURBULENCE IN DRAG REDUCING FLOWS.
Technical rept.,
Gordon L. Guenterberg. Dec 72, 101p
Contract N00014-67-A-0181-0030

Descriptors: (*Pipes, Drag), (*Fluid flow, Pipes), Styrene plastics, Injection, Shear stresses, Turbulence, Gas lasers, Methanols, Anemometers, Signal-to-noise ratio, Scattering, Flow fields.
Identifiers: Velocity profiles, Reynolds stress, *Laser Doppler anemometers.

The drag reduction, mean flow, and turbulence properties of several concentrations of Separan AP30 and water in a fully developed turbulent pipe flow were studied using a two-conpoment laser-Doppler anemometer. This measurement technique was chosen because of its inherent advantages over the traditional measuring techniques that have been used in previous studies of drag reducing flows. A polymer injection technique was used. A slurry of methanol and polymer powder was injected directly into the flowing water, providing a fresh, unaged polymer solution. (Author Modified Abatract)

AD-757 078 PC$3.00/MF$0.95
California Inst of Tech Pasadena Div of Engineering and Applied Science
VISCOUS EFFECTS IN INCEPTION AND DEVELOPMENT OF CAVITATION ON AXI-SYMMETRIC BODIES. PART I. CAVITATION INCEPTION. PART II. A SEMI-EMPIRICAL METHOD TO PREDICT CAVITATION SEPARATION ON SMOOTH BODIES,
Vijay H. Arakeri. Jan 73, 168p Rept no. ENG-183-1
Contract N00014-67-A-0094-0023

Descriptors: (*Cavitation, *Flow separation), (*Water tunnels, *Flow visualization), Schlieren photography, Viscosity, Laminar flow, Correlation techniques, Mathematical models, Bodies of revolution, Pressure, Surface properties.
Identifiers: Smooth bodies, Axially symmetric bodies.

The schlieren method was adapted as a flow visualization technique for use in water tunnels. The process of cavitation development on two axisymmetric bodies was studied using this approach and found to be greatly influenced by the presence of a previously unreported viscous laminar separation. Approximate computations of the position of transition on a body without laminar separation indicate that the incipient cavitation index is closely correlated with a negative value of the pressure coefficient at the predicted point of transition. Cavitation separation under fully developed conditions was investigated for viscous laminar boundary layer separation under fully wetted conditions. (Author Modified Abstract)

AD-757 201 Not available NTIS
Poitiers Univ (France) Faculte des Sciences
LES SOUFFLERIES HYPERSONIQUES DU CENTRE D'ETUDES AERODYNAMIQUES ET THERMIQUES DE POITIERS (THE HYPERSONIC WINDTUNNELS OF THE CENTER FOR AERODYNAMICS AND THERMAL STUDIES IN POITIERS),
M. R. Goethals. 1965, 19p
Text in French.
Availability: Pub. in Proceedings of Conference of the Societe d'Encouragement pour l'Industrie Nationale Held 1 April 65, p15-32.

Descriptors: (*Hypersonic wind tunnels, *France), Physics laboratories, Rotary compressors, Design, Pressure, Force (Mechanics), Instrumentation.

AD-757 254 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
OSCILLATING BODIES IN SUPERSONIC FLOW.
Master's thesis,
Rodger Bosley Carter. Dec 72, 141p

Descriptors: (*Aerodynamic configurations, *Supersonic characteristics), Conical bodies, Wedges, Flat plate models, Frequency, Wind tunnel models, Test methods, Instrumentation, Photographic techniques, Theses.
Identifiers: Quasi steady flow, Oscillating bodies, Oscillographs.

Three shapes - a cone, a wedge, and a flat plate - were oscillated at various frequencies up to 16 cycles per second in a Mach 2.8 flow to determine the extent of the validity of the quasi-study flow assumption. Instantaneous static pressure measurements and schlieren high speed movies were made and analyzed. The frequency was found where the measured pressures started a linear deviation from quasi-steady flow. The absolute pressure being measured, the amplitude, and the transverse velocity of the static pressure port were additional variables. (Author Modified Abstract)

AD-757 266 PC$3.00/MF$0.95
Office of Naval Research London (England)
FLUID MECHANICS AND FINITE ELEMENTS,
David F. Dyer. 29 Dec 72, 16p Rept no. ONRL-R-21-72

Descriptors: (*Fluid flow, Numerical analysis), Navier-Stokes equations, Reynolds number, Symposia, Great Britain.
Identifiers: Finite element analysis.

A report on the International Conference entitled Variational Methods in Engineering, is given. The report describes the interest of the participants at the conference and deals particularly with the part of the conference devoted to fluid mechanic problems. The problem of using variational methods in fluid mechanics is discussed and the papers presented at the conference on this topic are reviewed. It is concluded that it will be difficult to apply variational methods to non-linear problems. (Author)

AD-757 284 Reprint
Catholic Univ of America Washington D C
EXPERIMENTS ON FLOW ABOUT A YAWED CIRCULAR CYLINDER,
T. W. Kao, R. A. Smith, and Woo Taik Moon. 28 Oct 71, 6p
Sponsored in part by the Office of Naval Research, Arlington, Va. Presented at the Gas Turbine and Fluids Engineering Conference and Products Show, San Francisco, Calif., 26-30 Mar 72 of the American Society of Mechanical Engineers. (Paper No. 72-FE-2).
Availability: Pub. in the Transactions of the ASME, Jnl. of Basic Engineering, p771-776 Dec 72.

Descriptors: (*Cylindrical bodies, Subsonic characteristics), Yaw, Wake, Boundary layer transition, Drag, Reynolds number, Flow separation, Vortices, Base pressure, Flow fields, Equations of motion.
Identifiers: Near wake, Vortex shedding.

Experiments were performed to evaluate the influence of yaw angle on circular cylinder pressure drag and near wake characteristics in the range of Reynolds numbers 2000 to 10,000. It was found that the transition in the wake from laminar to turbulent motion was significantly promoted as the angle of yaw increased. As a result, wake properties such as base pressure and position of transition to turbulence do not obey the Independence Principle which requires that properties be dependent only on the normal component of the free-stream conditions. (Author)

AD-757 301 Not available NTIS
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Goettingen (West Germany)
EIN BEITRAG ZUR NIGHTLINEAREN STABILITAETSTHEORIE VON EBENEN LAMINARSTROEMUNGEN (A CONTRIBUTION TO THE NON-LINEAR STABILITY THEORY OF PLANE LAMINAR FLOWS),
D. Grohne. 30 Aug 71, 4p Rept no. DFVLR-Sonderdruck-250
Text in German.
Availability: Pub. in ZAMM, v52 p256-257 1972.

Descriptors: (*Laminar flow, Stability), Differential equations, Theory, West Germany, Nonlinear systems.

AD-757 330 PC$3.00/MF$0.95
Naval Ordnance Lab White Oak Md
MEASUREMENTS OF A MACH 4.9 ZERO-PRESSURE-GRADIENT TURBULENT BOUNDARY LAYER WITH HEAT TRANSFER. PART 1. DATA COMPILATION,
Robert L. P. Voisinet, and Roland E. Lee. 27 Sep 72, 105p Rept no. NOLTR-72-232

Descriptors: (*Nozzle gas flow, *Turbulent boundary layer), Supersonic characteristics, Heat transfer, Skin friction, Boundary layer control, Two-dimensional flow, Instrumentation, Nozzle throats, Statistical data.

The results of a detailed experimental investigation of the compressible turbulent boundary layer in a zero-pressure-gradient flow are presented for zero, moderate and severe heat-transfer conditions. The studies were conducted on a flat nozzle wall for a nominal Mach number of 4.9, at momentum thickness Reynolds numbers from 7,000. to 58,000. and at wall-to-adiabatic-wall temperature ratios of 1.0, 0.8 and 0.25. Complete profile measurements were taken with Pitot pressure probes and conical-equilibrium and fine-wire temperature probes. Furthermore, the wall shear and surface heat transfer were measured directly with a skin-friction balance and a heat-transfer gage, respectively. (Author Modified Abstract)

AD-757 434 Reprint
Catholic Univ of America Washington D C
NOSE PRESSURE DISTRIBUTION AND SEPARATION ON AN INCLINED AXISYMMETRIC BODY,
Russell A. Smith, and S. Nosakhare Evbouma. 20 Sep 72, 2p
Contract N00014-68-A-0506-0001
Prepared in cooperation with Illinois Univ., Urbana. Revision of report dated 24 Aug 72.
Availability: Pub. in AIAA Jnl., v11 n1 p125-126 Jan 73.

Descriptors: (*Cylindrical bodies, *Subsonic characteristics), Bodies of revolution, Axially symmetric flow, Hemispherical shells, Angle of attack, Shear stresses, Flow visualization, Wind tunnel models, Correlation techniques.
Identifiers: Viscous flow, Pressure distribution, Oil drop tests.

When a body of revolution is inclined to a small angle of attack, a large region of separated flow occurs on the leeward side of the body. The effect of this viscous phenomenon on the surface pressure distribution of a hemispherical nose with a cylindrical afterbody is examined.

AD-757 443 Reprint
California Inst of Tech Pasadena
VISCOUS FLOW PAST CIRCULAR CYLINDERS,
F. Nieuwstadt, and H. B. Keller. 1 Sep 72, 14p
AROD-7625:25-M
Contract DAHC04-68-C-0006
Availability: Pub. in Computers and Fluids, v1 p59-71 1973.

Descriptors: (*Cylindrical bodies, Laminar flow), Problem solving, Vortices, Flow fields, Reynolds number, Navier-Stokes equations, Approximation (Mathematics), Errors.
Identifiers: Stream functions, Viscous flow.

Accurate and efficient calculations of the flow around a circular cylinder are presented for Reynolds numbers from 1 to 40 (based on the diameter). The semi-analytical method of series truncation is used to express the stream function and the vorticity in a finite Fourier series. Substitution into the Navier-Stokes equations yields a finite system of nonlinear ordinary differential equations. These are approximated by two-point boundary value methods. The resulting nonlinear difference equations are solved using Newton's method. Much attention has been given to numerical errors and errors resulting from the approximation by a finite series. The results are compared with similar calculations by Keller-Takami and Dennis-Chang. (Author Modified Abstract)

AD-757 464 Not available NTIS
Deutsche Versuchsanstalt Fuer Luft-Und Raumfahrt E V Berlin (West Germany) Institut Fuer Turbulenzforschung
BEITRAEGE ZUR PHAENOMENOLOGIE DER FREISTRAHLEN (PHENOMENOLOGY OF FREE JETS),
Rudolf Wille. 21 Jan 63, 32p DVL-292
Availability: Pub. in Zeitschrift fuer Flugwissenschaften, v11 n6 p222-233 1963.

Descriptors: (*Nozzle gas flow, Jets), Flow fields, Turbulence, Laminar boundary layer, Flow visualization, West Germany.

The influence of the geometrical form of a jet nozzle on the development of a free jet has been investigated. Far downstream the mean velocity profiles of W. Tollmien and H. Schlichting are characterising the jet independent of the nozzle geometry. Near the orifice, however, where the excitation of turbulence and noise as the re-shaping of the mean velocity profiles occurs, the nozzle contour and the initial conditions of the jet are of influence. The special case of a laminar jet boundary layer can be analysed to a certain degree and the results can be illustrated by measurements of the mean and fluctuating velocities as well as by streak line photographies. (Author)

AD-757 531 PC$3.00/MF$0.95
Boeing Commercial Airplane Co Seattle Wash
EVALUATION OF SEPARATION CRITERIA AND THEIR APPLICATION TO SEPARATED FLOW ANALYSIS.
Final rept. 24 Jan 72-24 Jan 73,
Mansop Hahn, Paul E. Rubbert, and Avtar S. Mahal. 24 Jan 73, 80p Rept no. D6-41070 AFFDL-TR-72-145
Issued as Boeing document prior to receiving U. S. Air Force approval.

Descriptors: (*Turbulent boundary layer, *Flow separation), Two-dimensional flow, Three-dimensional flow, Subsonic characteristics, Transonic characteristics, Mathematical prediction, Mathematical models, Airfoils.
Identifiers: Criteria.

Various criteria of turbulent boundary layer separation have been reviewed for two- and three-dimensional flows at subsonic and transonic Mach numbers. Six criteria which predict separation have been evaluated by comparing their predictions with the results of a number of separated flow experiments. A modified form of Townsend;s criterion predicts satisfactorily both separation pressure and separation location for subsonic flow. An approach based on calculation of the boundary layer characteristics along the surface has proved to be quite satisfactory for predicting both separation pressure and location for subsonic flow. A boundary condition requiring constant pressure on the surface in the separated region has

been used to determine the fluid emission. (Author Modified Abstract)

AD-757 584 PC$3.00/MF$0.95
Johns Hopkins Univ Silver Spring Md Applied Physics Lab
THE EFFECT OF WALL SUCTION ON THE TURBULENT PIPE-FLOW FRICTION COEFFICIENT.
Technical memo.,
R. W. Allen, R. Kalny, and R. W. Newman. Jan 73, 59p Rept no. APL-TG-1180
Contract N00017-72-C-4401

Descriptors: (*Boundary layer control, Heat transfer), (*Pipes, Friction), Turbulent boundary layer, Correlation techniques, Theory, Experimental data, Cooling.
Identifiers: *Wall suction, *Porous pipes.

The report deals with the flow-friction induced by wall suction at the boundary walls of main channels in missile transpiration-cooling systems, gas-turbine heat exchangers, porous-wall chemical reactors, and pipe condensers of space power plants. The pronounced effect of wall suction on the friction of turbulent flow in these systems prompts a search for verified engineering flow-friction correlations. Results of a series of experiments are reported, together with an analysis of related experiments reported earlier in the literature. Comparisons are made with previous porous-pipe turbulent-flow experiments of Weissberg and Berman and with the later porous-pipe experiments of Burnage and the results of the self-similar analytical theory of turbulent pipe-flow with suction are also compared with experiment. (Author Modified Abstract)

AD-757 635 PC$3.00/MF$0.95
Ballistic Research Labs Aberdeen Proving Ground Md
CORRELATION PARAMETERS FOR TWO DIMENSIONAL JET INTERACTION,
Richard E. Lottero. Jan 73, 50p Rept no. BRL-1629

Descriptors: (*Boundary layer control, Control jets), Two-dimensional flow, Interactions, Flat plate models, Correlation techniques, Reviews, Injection.

The problem considered is the separation of the boundary layer on a flat plate in a high supersonic free stream caused by the normal injection of a two-dimensional sonic or supersonic jet. Only the separation region forward of the jet is discussed. Data from existing literature has been analyzed to form dimensionless correlation parameters that will accurately predict the force, center-of-pressure, and separation length that characterize this forward separation region. Problems related to the nozzle discharge coefficient are discussed. The functional relations of these correlations with respect to changes in jet stagnation temperature and pressure, nozzle throat width, and Mach number for fixed free stream conditions are also discussed. (Author Modified Abstract)

AD-757 724 PC$3.00/MF$0.95
Cincinnati Univ Ohio Dept of Aerospace Engineering
A QUASI-ANALYTICAL METHOD FOR THE CALCULATION OF PARTICLE TRAJECTORIES,
G. Grant, and W. Tabakoff. Feb 73, 71p Rept no. 73-35 AROD-10223:3-E
Grant DA-ARO-D-31-124-71-G154

Descriptors: (*Particle trajectories, Equations of motion), (*Fluid flow, Equations of motion), (*Sand, Particle trajectories), Reynolds number, Integration, Numerical analysis, Erosion, Computer programs, Nonlinear differential equations, Flow fields, Drag.

The equation of motion of a sand particle under the influence of aerodynamic drag has been developed in the inertial coordinate system. The method of solution presented is very easy to use in that only one first order differential equation has to be solved. The equation of motion has been integrated and solved for the special cases of one-dimensional steady flow and one-dimensional accelerating flow as well as the general case of two or three-dimensional accelerating flow. The computerized models of these three problems are presented along with solutions of example problems. High speed movies were taken of sand particles which had been accelerated in a specially designed tunnel. These results demonstrated the extreme accuracy of this method of solution. (Author)

AEEW-M-1139 PC$3.00/MF$0.95
Atomic Energy Establishment, Winfrith (England).
POSSIBLE MECHANISM FOR THE ATTENUATION OF THE EFFECT OF WALL FRICTION IN TWO-PHASE FLOW.
G. L. Shires. Oct 72, 8p
U. S. Sales only

Descriptors: *Fluid flow.

For abstract, see NSA 27 06, number 14338.

CEA-R-4302 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Grenoble (France). Centre D'Etudes Nucleaires.
MEASUREMENTS WITH A MICROTHERMOCOUPLE OF THE LOCAL VOID FRACTION AND THE TEMPERATURES OF THE LIQUID AND VAPOR IN TWO-PHASE FLOW WITH PHASE CHANGE.
J. M. Delhaye, R. Semeria, and J. C. Flamand. Nov 72, 52p
Lang- In French. U. S. Sales only

Descriptors: *Fluid flow, *Thermocouples.

For abstract, see NSA 27 06, number 11918.

N73-15989 PC$3.25
Imperial Coll. of Science and Technology, London (England). Dept. of Aeronautics.
ANOMALOUS EFFECTS OF PRESSURE GRADIENT ON SUPERSONIC TURBULENT BOUNDARY LAYERS.
P. Bradshaw. Nov 72, 22p IC-AERO-72-21
Contract MIN-DEF/PE-AT/2037/102

Descriptors: *Dilatational waves, *Pressure gradients, *Supersonic boundary layers, *Turbulent boundary layer, Compressible flow, Incompressible flow, Reynolds equation, Stresses, Variations.

For abstract, see STAR 11 07.

N73-15990 PC$5.50/MF$0.95
Deutsche Forschungs- Und Versuchsanstalt Fuer Luft- Und Raumfahrt, Aachen (West Germany). Inst. Fuer Theoretische Gasdynamik.
THE INTERACTION OF INCIDENT SHOCK WAVES WITH PLANE BLUNT BODY FLOW . DER EINFLUSS EINFALLENDER STOSSWELLEN AUF EBENE UEBERSCHALLSTROEMUNGEN UM STUMPFE KOERPER.
D. Rues. Jun 72, 67p DLR-FB-72-68
Language German English Summary

Descriptors: *Blunt bodies, *Shock wave interaction, *Supersonic flow, Circular cylinders, Difference equations, Parabolic bodies, Unsteady flow.

For abstract, see STAR 11 07.

N73-16245 PC$3.00/MF$0.95
Case Western Reserve Univ., Cleveland, Ohio.
A GENERAL RELAXATION THEORY OF SIMPLE LIQUIDS.
M. Merilo, and E. J. Morgan. Jan 73, 132p
NASA-CR-2141, FTAS/TR-72-73
Contracts NGL-36-003-064, NSF GK-02866

Descriptors: *Dynamic characteristics, *Fluid flow, *Molecular relaxation, Distribution functions, Isotropy, Viscoelasticity.

For abstract, see STAR 11 07.

N73-16246 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
PRELIMINARY STUDY OF A WALL STABILIZED CONSTRUCTED ARC.
R. A. Graves, and W. L. Wells. Feb 73, 36p
NASA-TM-X-2700, L-8631

Descriptors: *Arc heating, *Arc jet engines, *Iterative solution, *Magnetohydrodynamic flow, *Viscous flow, Axial flow, Boundary layers, Heat transfer, Spectroscopy.

For abstract, see STAR 11 07.

PAT-APPL-315048 PC$3.25/MF$0.95
Inca Engineering Corp., San Gabriel, Calif.
AN APPARATUS FOR ESTABLISHING FLOW OF FLUID MASS HAVING A KNOWN VELOCITY.
Patent Application
P. Price, O. Veikins, E. R. Bate, Jr., and R. H. Jones. Filed 14 Dec 72, 23p
NASA-CASE-MFS-21424-1
Subm- Sponsored By Nasa
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Flow stability, *Flow velocity, *Fluid flow, *Gas flow, *Generators, Calibrating, Gas generators, Hot-wire anemometers, Patent applications.

An apparatus for establishing a flow of fluid mass having a known velocity is described. It is characterized by an hermetically sealed chamber conforming to a closed-loop configuration that includes a throat and axially displaceable pistons for sweeping through the throat a stream of gas. Within the throat is a cylindrical coring body concentrically related to the throat for receiving the core, and a chamber surrounding the cylindrical body for drawing off the boundary layer, whereby the velocity of the core is liberated from the effects of the velocity of the boundary layer.

N73-16249 PC$4.75/MF$0.95
Lockheed Missiles and Space Co., Huntsville, Ala. Research and Engineering Center.
CALCULATION OF STABILITY DERIVATIVES FOR SLOWLY OSCILLATING BODIES OF REVOLUTION AT MACH 1.0.
S. Y. Ruo, and D. D. Liu. Feb 71, 52p
NASA-CR-124033, HREC-0082-24
Contracts NAS8-20082, NSL-PO-5-09287
Subm- Prepared for Northrop Nortronics, Palos Verdes Peninsula, Calif.

Descriptors: *Circular cones, *Ogives, *Parabolic bodies, *Stability derivatives, *Transonic flow, Bodies of revolution, Computer programming, Flow distribution, Iterative solution, Oscillating cylinders.

For abstract, see STAR 11 07.

N73-16252 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
LOW GRAVITY REORIENTATION IN A SCALE-MODEL CENTAUR LIQUID--HYDROGEN TANK.
J. A. Salzman, W. J. Masica, and R. F. Lacovic. Feb 73, 33p NASA-TN-D-7168, E-7098

Descriptors: *Centaur launch vehicle, *Cryogenic fluid storage, *Fluid dynamics, *Fuel tanks, *Liquid hydrogen, Baffles, Liquid filled shells, Liquid sloshing, Stabilization.

For abstract, see STAR 11 07.

N73-16253 PC$3.75/MF$0.95
New York Univ., N.Y.
TURBULENT BOUNDARY LAYER IN AN ADVERSE PRESSURE GRADIENT WITHOUT EFFECT OF WALL CURVATURE.
V. Zakkay, and W. Chi-rong. Nov 72, 35p
NASA-CR-112247
Contract NGR-33-016-181

Descriptors: *Compressible boundary layer, *Cylindrical bodies, *Hypersonic boundary layer, *Pressure gradients, *Turbulent boundary layer, Axisymmetric flow, Nozzle flow, Transient heating, Wall flow.

For abstract, see STAR 11 07.

N73-16255 PC$3.00/MF$0.95
National Bureau of Standards, Boulder, Colo.
CAVITATION IN LIQUID CRYOGENS. 2 HYDROFOIL.
J. Hord. Jan 73, 162p NASA-CR-2156
NASA ORDER C-39004-B

Descriptors: *Cavitation flow, *Cryogenic fluids, *Hydrofoils, *Thermodynamics, Cryogenics, Liquid hydrogen, Liquid nitrogen, Nucleation, Pumps, Two phase flow.

For abstract, see STAR 11 07.

N73-16256 PC$16.25/MF$0.95
Deutsche Forschungs- Und Versuchsanstalt Fuer Luft- Und Raumfahrt, Goettingen (West Germany).
LAMINAR AND TURBULENT BOUNDARY LAYER . LAMINARE UND TURBULENTE GRENZSCHICHTEN.
1971, 284p DLR-MITT-71-13
Language German English Summaries

Descriptors: *Conferences, *Hypersonic flow, *Laminar boundary layer, *Stagnation point, *Turbulent boundary layer, Equations of motion, Jet mixing flow, Mathematical models, Wall flow.

For abstract, see STAR 11 07.

N73-16272 PC$10.00/MF$0.95
Deutsche Forschungs- Und Versuchsanstalt Fuer Luft- Und Raumfahrt, Berlin (West Germany). Inst. Fuer Turbulenzforschung.
SOLUTION OF THE BOUNDARY LAYER EQUATIONS FOR CHEMICALLY REACTING GASES BY MEANS OF A HERMITIAN FINITE DIFFERENCE METHOD . LOESUNG DER GRENZSCHICHTGLEICHUNGEN FUER CHEMISCH REAGIERENDE GASE MIT EINEM MEHRSTELLENVERFAHREN.
N. Peters. Jan 72, 157p DLR-FB-72-58
Language German English Summary

Descriptors: *Binary fluids, *Boundary layer flow, *Finite difference theory, Chemical reactions, Computer programming, Flat plates, Gas mixtures, Hermitian polynomial, Laminar flow, Nonequilibrium flow.

For abstract, see STAR 11 07.

N73-16453 PC$3.25/MF$0.95
Ernst-mach-inst., Freiburg (West Germany).
REGULAR REFLECTION OF SHOCK WAVES.
W. Heilig. Dec 71, 21p REPT-9/71
Language German English Summary

Descriptors: *Mathematical models, *Reflected waves, *Shock waves, Equations of state, Ideal gas, Shock wave interaction, Shock wave propagation.

For abstract, see STAR 11 07.

N73-16675 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
TURBULENT TRANSPORT MEASUREMENTS WITH A LASER DOPPLER VELOCIMETER.
R. V. Edwards, J. C. Angus, and J. W. Dunning, Jr. 1972, 17p NASA-TM-X-68184, E-7299
Subm- Sponsored in Part By Onr, Nih, and Nsf

Descriptors: *Doppler effect, *Laser outputs, *Power spectra, *Velocity measurement, Flowmeters, Heterodyning, Phototubes, Spectrum analysis, Speed indicators.

For abstract, see STAR 11 07.

N73-16975 PC$4.00/MF$0.95
Brussels Univ. (Belgium). Inst. de Mecanique Appliquee.
ACTIVITIES OF THE INSTITUTE OF APPLIED MECHANICS, 1957-1972 . QUINZE ANS DACTIVITE DE LINSTITUT DE MECANIQUE APPLIQUEE DE LUNIVERSITE LIBRE DE BRUXELLES, 1957-1972.
1972, 36p NT-32-1972
Language French

Descriptors: *Belgium, *Bibliographies, *Fluid mechanics, *Plasma physics, Cascade flow, Fluidics, Ground effect machines, Thermodynamics, Theses, Turbomachinery.

For abstract, see STAR 11 07.

UCRL-72650 PC$3.00/MF$0.95
California Univ., Livermore. Lawrence Radiation Lab.
AN EMPIRICAL THEORY FOR LARGE AMPLITUDE RAYLEIGH-TAYLOR INSTABILITY.
W. P. Crowley. 7 Aug 70, 33p

Descriptors: *Fluid flow.

For abstract, see NSA 27 06, number 14447.

20E. Masers and Lasers

AD-757 072 PC$3.00/MF$0.95
Gte Labs Inc Waltham Mass
HIGH-ENERGY PULSED LIQUID LASER.
Semi-annual technical summary rept.,
H. Samelson, R. Kocher, and A. Lempicki. 28 Feb 73, 19p Rept no. TR-73-826.1
Contract N00014-68-C-0110, ARPA Order-1806

Descriptors: (*Lasers, Performance (Engineering)), Irasers, Cooling + ventilating equipment, Hydraulic systems, Power supplies, Flash lamps, Light pulses, Power.
Identifiers: *Liquid lasers.

The report covers the construction of a liquid laser designed for operation as an oscillator-amplifier in the high brightness mode. The new aspects of the design of the laser cells, the cooling system and the power supply are presented and discussed. The entire system is nearly ready to be put into operation. (Author)

AD-757 083 PC$3.00/MF$0.95
United Aircraft Research Labs East Hartford Conn
STABILITY OF IONIZED MOLECULAR GAS FLOWS.
Annual rept. 15 Mar 72-14 Mar 73,
W. L. Nighan, Walter J. Wiegand, and Robert H. Bullis. 14 Mar 73, 50p Rept no. UARL-M921325-2
Contract N00014-72-C-0380

Descriptors: (*Gas ionization, *Gas lasers), Scientific research, Plasma medium, Carbon dioxide, Irasers, Gas discharges, Electron density, Excitation, Gas flow.
Identifiers: *Carbon dioxide lasers, Collisional energy transfer.

A theoretical investigation of the factors influencing the stability of molecular gas discharges typical of those utilized in high power laser systems has been carried out. These studies have revealed the mechanisms by which basic electronic, ionic, and neutral collision processes effect discharge plasma stability. The details of the electron-molecule attachment process, the characteristics of the resulting negative ion, and the nature of the negative ion detachment mechanism have been found to be particularly important. In addition, it has been shown that conditions typically encountered in molecular laser discharges are compatible with the occurrence of both ionization instability. The report summarises in tutorial fashion the key findings of the research completed to date, and identifies areas of importance which will receive emphasis in forthcoming investigations. (Author Modified Abstract)

AD-757 086 PC$4.50/MF$0.95
Hughes Research Labs Malibu Calif
PLASMA CATHODE FOR E-BEAM LASERS.
Semiannual technical rept., 1 May-30 Nov 72,
R. C. Knechtli, and G. N. Mercer. 30 Nov 72, 72p*
Contract N00014-72-C-0496, ARPA Order-1807

Descriptors: (*Gas lasers, Electron guns), (*Electron guns, Cathodes), Plasma medium, Electron bombardment, Electron beams, Electric discharges.

The technical goal of this program is to develop a superior substitute for the thermionic-cathode electron gun used for plasma conditioning in high energy lasers. Specifically, the program is directed toward developing a hollow cathode plasma electron source to replace the thermionic source commonly used in these electron guns. To fulfill the technical goals of the program, a theoretical and experimental development program is being carried out. A small scale prototype of the plasma cathode electron gun has been constructed and tested with excellent results. A high-voltage, full-size module is now under construction. (Author Modified Abstract)

AD-757 088 PC$4.50/MF$0.95
Rockwell International Corp Anaheim Calif Electronics Research Div
TUNABLE 10 MICRON LASER, AN INTEGRATED OPTICS APPROACH TO INFRARED GAS LASERS.
Interim technical rept. 1 Jun-31 Dec 72,
D. B. Anderson, and R. Shubert. 26 Feb 73, 72p*
Rept no. C72-650.10/501
Contract N00014-72-C-0505, ARPA Order-1806

Descriptors: (*Gas lasers, Design), (*Irasers, Design), Carbon dioxide, Discharge tubes, Tuning devices.
Identifiers: *Carbon dioxide lasers, Tunable lasers.

Current progress toward the development of a tunable CO2 laser using an integrated optics approach is described. Design parameters for application as a local oscillator in an optical heterodyne receiver are emphasized with tunability to accommodate the large doppler offset. The integrated optics approach employs a nonuniform distributed iterative passive waveguide in close proximity to a planar active gas waveguide to form the resonant circuit. Backward wave Bragg diffraction coupling is employed between the active gas waveguide and the passive feedback waveguide. Transverse gas flow and transverse excitation are considered. The characteristics of nonuniform distributed feedback laser ring resonant circuits are analyzed employing a coupled mode approach. A 0.6 mm

diameter bore capillary waveguide laser has been demonstrated. (Author Modified Abstract)

AD-757 099 PC$3.00/MF$0.95
Whittaker Corp Waltham Mass Space Sciences Div
THE STUDY OF IMPROVED ELECTRODES FOR ION LASERS AND FOR MOLECULAR GAS LASERS.
Final rept. 1 Apr 71-31 Mar 72,
Sol Aisenberg, and Kuo Wei Chang. Nov 72, 62p
Rept no. SSD-P-677-FR
Contract N00014-71-C-0337

Descriptors: (*Gas lasers, Cathodes), Glow discharges, Argon, Electron transitions, Atomic energy levels, Efficiency, Carbon dioxide, Irasers.
Identifiers: *Ion lasers, *Carbon dioxide lasers, *Argon lasers, Electron energy.

The program involves the study of improved electrode structures to lead to high efficiency ion lasers and high power high efficiency CO2 lasers. Various designs were explored but actual improved lasers were not completed in this short study program. An improved ion laser system is suggested whigh uses the more favorable hollow cathode electron beam discharge to produce CW and pulsed laser oscillations in both visible and UV ranges. A novel dual-plasma approach for high pressure, high power laser operation is also devised for the development of efficient, compact and powerful CO2 lasers. (Author Modified Abstract)

AD-757 135 Reprint
National Bureau of Standards Washington D C Inst for Basic Standards
OBSERVATION OF COHERENT MICROWAVE RADIATION EMITTED BY COUPLED JOSEPHSON JUNCTIONS,
T. F. Finnegan, and S. Wahlsten. 10 Jul 72, 4p
Sponsored in part by the Office of Naval Research, Arlington, Va.
Availability: Pub. in Applied Physics Letters, v21 n11 p541-544, 1 Dec 72.

Descriptors: (*Masers, Superconductors), Microwaves, Infrared radiation, Coherent radiation.
Identifiers: Josephson junctions, Far infrared radiation.

The authors report the results of a preliminary study of coherent microwave radiation emitted by a small array of interacting Josephson tunnel junctions, including the first direct observation of the superradiant state in pairs of junctions. (Author)

AD-757 249 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
THE CONSTRUCTION OF A ND:YAG LASER TO STUDY ATMOSPHERIC TRANSMISSION PROPERTIES.
Master's thesis,
Patrick Ralph O'Harrow. Dec 72, 34p

Descriptors: (*Lasers, Design), (*Irasers, Physical properties), Yttrium compounds, Aluminates, Garnet, Doping, Neodymium, Atomic energy levels, Electron transitions, Fluorescence, Pumping (Optical), Cooling + ventilating equipment, Performance (Engineering), Theses, Light transmission, Atmosphere.
Identifiers: Neodymium lasers, YAG lasers, Laser beams, Atmospheric attenuation, Near infrared radiation.

A neodymium laser was constructed to be used in a study of atmospheric transmission properties of 1.06 micor-meter radiation. A Nd:YAG crystal was selected for use in the laser, and the physical and chemical properties of Nd:YAG as compiled from the literature are presented. A detailed description of the laser system design is given with the expected operational characteristics. The laser was operationally tested a number of times during which several of the design parameters were varied, but lasing action was never observed. An outline of the probable causes for failure is given in the concluding remarks. (Author)

AD-757 263 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
THE DESIGN, CONSTRUCTION, AND OPERATION OF A CO2-N2-HE LASER.
Master's thesis,
Clarence Vernon McIntosh, Jr.. Dec 72, 45p

Descriptors: (*Gas lasers, Design), (*Irasers, Design), Carbon dioxide, Nitrogen, Helium, Atomic energy levels, Electron transitions, Mirrors, Infrared windows, Power supplies, Cooling + ventilating equipment, Performance (Engineering), Theses.
Identifiers: *Carbon dioxide lasers, Intermediate infrared radiation.

A five-watt CO2-N2-He Laser was designed and constructed. The lasing mechanism of the CO2-N2-He gas mixture is reviewed. Beam characteristics and power output as a function of gas mixture parameters are presented. (Author)

AD-757 310 Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
COAXIAL MARX - BANK DRIVER AND FLASHLAMP FOR OPTICAL EXCITATION OF ORGANIC DYE LASERS,
Theodore F. Ewanizky, and Roland H. Wright, Jr. 5 May 72, 3p
Availability: Pub. in Applied Optics, v12 n1 p120-122 Jan 73.

Descriptors: (*Lasers, Pumping (Optical)), (*Flash lamps, Design), Dyes, Optical equipment, Performance (Engineering).
Identifiers: *Organic dye lasers.

A flashlamp pumped laser system that uses a coaxial Marx-Bank driver circuit is described. The property of the Marx-Bank circuit, which is to charge storage capacitors in parallel but discharge them in series connection, affords the practical advantage that high applied voltages and flashlamp input energies may be attained with a relatively low dc charging voltage. The use of a coaxial flashlamp and circuit configuration minimizes total inductance so that short duration, high energy pulses efficient for dye laser excitation are obtained. (Author)

AD-757 520 PC$3.00/MF$0.95
Sanders Associates Inc Nashua N H Electro-Optics Div
STUDIES OF THE SENSITIZATION MECHANISMS OF RARE EARTH DETECTION AND LASER MATERIALS.
Interim scientific rept. 1 Apr 71-31 Mar 72,
Evan P. Chicklis, and Charles S. Naiman. Feb 73, 40p AFOSR-TR-73-0500
Contract F44620-70-C-0068

Descriptors: (*Lasers, Optical materials), Lithium compounds, Fluorides, Yttrium compounds, Doping, Holmium, Luminescence, Atomic energy levels, Electron transitions, Life expectancy.
Identifiers: *Lithium tetrafluoroyttriate, *Laser materials, *Holmium lasers.

The report summarizes spectroscopic studies of energy transfer in rare earths with particular attention devoted to transfer phenomena in multiply sensitized (Er-TM)Ho (3+):YLF (LiYF4). Energy transfer was studied as a function of Ho (3+) and Tm (3+) concentration and temperature. A model for the Tm-Ho transfer versus Ho and Tm concentration is presented which predicts the observed dependence of the Ho lifetime and fluorescence yield on the Tm:Ho population ratios and the temperature. The effects of the transfer phenomena on the 2 micrometer lasing efficiency of multiply sensitized Ho:YLF (alpha beta LF) are discussed.

AD-757 562 PC$3.00/MF$0.95
Oregon Graduate Center for Study and Research Beaverton
PROPAGATION OF MULTIWAVELENGTH LASER RADIATION THROUGH ATMOSPHERIC TURBULENCE.
Quarterly rept. 15 Sep 15 Dec 72,
J. Richard Kerr. 15 Jan 73, 81p Rept no. 1174-2
RADC-TR-73-54
Contract F30602-72-C-0470, ARPA Order-1279

Descriptors: (*Light transmission, Atmospheric motion), (*Coherent radiation, Scintillation), Irasers, Turbulence, Scattering, Attenuation, Probability density functions.
Identifiers: *Laser beams, *Atmospheric attenuation.

The report summarizes progress on three currently active efforts in the investigation of laser beam scintillations due to atmospheric turbulence. These topics are (1) multiwavelength scintillation over a long horizontal path with a very high integrated-path turbulence level; (2) finite-beam or transmitter aperture effects including beam wander, spread, and scintillation; and (3) turbulence intermittency effects. (Author Modified Abstract)

AD-757 585 PC$3.00/MF$0.95
Johns Hopkins Univ Silver Spring Md Applied Physics Lab
EXPERIMENTAL STUDIES OF A POTENTIAL PURE CHEMICAL CO2 LASER.
Technical memo.,
R. E. Walker, J. C. Pirkle, C. B. Bargeron, B. F. Hochheimer, and H. L. Olsen. Dec 72, 29p Rept no. APL-TG-1205
Contract N00017-72-C-4401

Descriptors: (*Gas lasers, Chemical reactions), (*Irasers, Chemical reactions), Reaction kinetics, Carbon dioxide, Chemiluminescence, Gain.
Identifiers: *Carbon dioxide lasers, *Chemical lasers, Emission spectra.

An experimental investigation is being made into a potenial pure chemical CO2 laser based on the Na-catalyzed combustion of CO with N2O. Combustion takes place in a simple chain reaction, which has been verified experimentally. Various experiments have evaluated chain length, chemical kinetics, effects of diluents and stoichiometry, chemiluminescence, emission spectra, and chemical laser gain at 10.6 micrometer; the results are reviewed in the report. (Author Modified Abstract)

AD-757 672 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
AM AND FM MODULATION OF A HELIUM--NEON LASER BEAM USING ACOUSTO-OPTICA; INTERACTION.
Master's thesis,
Osman Unlu. Dec 72, 51p

Descriptors: (*Gas lasers, Modulation), Frequency modulation, Amplitude modulation, Light communication systems, Photodiodes, Performance (Engineering), Theses.
Identifiers: Helium neon lasers, Laser beams, Acoustooptic modulators.

Acoustical amplitude and frequency modulation techniques of a CW helium-neon laser beam are presented. (The communication possibilities of this beam for both cases (AM and FM) are verified. Theories are discussed for the acoustooptical modulator and the p-i-n silicon photodetector. Designs of the elements of the systems and experimental results are presented. Operation of both systems is discussed. (Author)

LA-5102 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
TRANSMISSION OF A TRAIN OF SHORT, INTENSE LASER PULSES.
D. B. Henderson. Dec 72, 8p
Contract W-7405-ENG-36

Descriptors: *Air, *Laser radiation.

For abstract, see NSA 27 06, number 14400.

N73-16538 PC$3.50/MF$0.95
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
EQUATIONS FOR THE KINETIC MODELING OF SUPERSONICALLY FLOWING ELECTRICALLY EXCITED LASERS.
R. C. Lind. Jan 73, 29p NASA-TM-X-62196
Subm- Sponsored in Part By Nas-nrc

Descriptors: *Boltzmann transport equation, *Lasers, *Mathematical models, *Supersonic flow, Carbon monoxide, Diatomic gases, Kinetic theory.

For abstract, see STAR 11 07.

UCRL-51285 PC$3.00/MF$0.95
California Univ., Livermore. Lawrence Livermore Lab.
CHEMICAL LASERS- AN OVERVIEW OF THE LITERATURE, 1960-1971.
B. M. Dobratz. Sep 72, 57p
Contract W-7405-ENG-48

Descriptors: *Lasers.

For abstract, see NSA 27 06, number 14446.

20F. Optics

AD-757 070 MF$0.95
City Coll New York Dept of Physics
ADVENTURES IN GREEN'S LAND: LIGHT SCATTERING IN ANISOTROPIC MEDIA.
Technical rept.,
M. Lax, and D. F. Nelson. Feb 73, 34p Rept no. TR-2
Contract N00014-72-A-0406-0003
Prepared in cooperation with Bell Labs., Murray Hill, N.J.
Availability: Available in Microfiche only.

Descriptors: (*Light transmission, Crystals), Coherent radiation, Scattering, Green's function, Anisotropy.
Identifiers: *Light scattering, Wave equations, Brillouin scattering.

Since the scattering volume in a crystal in a typical Brillouin scattering experiment using laser excitation is small but finite, solution of the wave equation by a Green's function technique is most convenient. Two things greatly complicate such a calculation: (1) the optical anisotropy of the crystal leads to nonspherical wave surfaces (even in the far field) and to noncollinearity of the propagation and energy flow vectors and (2) detection of the scattered light outside the crystal requires the inclusion of a crystal surface in the radiation problem. Two mutally consistent approaches to this problem are presented. First, a far field Green's function inside the crystal is calculated. The detected power outside the crystal is then calculated from it and the surface coupling factors - solid angle expansion, scattering volume demagnification and transmissivity. Second, a far field Green's function outside the crystal is calculated for several cases. A scattered power formula valid outside the crystal, which applies to crystals of any symmetry and orientation, to any scattering angle, and to fairly general surface orientations, is then presented. (Author Modified Abstract)

AD-757 082 PC$3.00/MF$0.95
Pennsylvania State Univ University Park Dept of Physics
STIMULATED AND SPONTANEOUS SCATTERING.
Technical rept. 1 Mar 72-28 Feb 73,
T. A. Wiggins. 28 Feb 73, 70p
Contract N00014-67-A-0385-0012

Descriptors: (*Light transmission, *Rayleigh scattering), Coherent radiation, Styrene plastics, Radiation damage, Frequency shift, Acoustic properties, Diffusion, Methane, Hydrogen, Interferometers, Solutions.
Identifiers: *Light scattering, Sulfur hexafluoride, Acoustic velocity, Brillouin scattering.

Presented are the following reports on stimulated and spontaneous scattering: Sound speeds and laser induced damage in polystyrene; Forward stimulated thermal Rayleigh scattering; Frequency shifts in stimulated Rayleigh wing scattering; Hypersound speeds in sulfur hexafluoride; Measurement of the mutual diffusion constant of hydrogen in methane by means of spontaneous light scattering.

AD-757 211 PC$3.00/MF$0.95
Maryland Univ College Park Dept of Electrical Engineering
THE STUDY OF THE INTERACTION OF INTENSE PICOSECOND LIGHT PULSE WITH MATERIALS: A THEORY OF THIRD HARMONIC GENERATION IN AN ISOTROPIC NONLINEAR MEDIUM WITH ULTRASHORT LIGHT PULSES.
Quarterly technical rept. 22 Sep-21 Dec 72,
Chi H. Lee, and David W. Coffey. 15 Jan 73, 62p
Rept no. TR-012
Grant DA-ARO-D-31-124-71-G82, ARPA Order-675
See also report dated 1 Nov 72, AD-753 677.

Descriptors: (*Coherent radiation, Light pulses), (*Light pulses, Harmonic analysis), Wave functions, Partial differential equations, Taylor's series, Fourier analysis, Integral transforms, Nonlinear systems, Theses.
Identifiers: Third harmonic generation, Nonlinear optics, *Laser beams, Mode locked lasers, Wave equations.

The report contains the development of a theory for third harmonic generation (THG) due to a broad band optical pulses such as existing in the picosecond time region. The theory is than applied to several examples. Specifically, Maxwell's equations are used as the starting point and a wave equation for the THG is developed for a uniform plane wave in a dielectric, isotropic medium. The material parameters considered are the nonlinear susceptibility giving rise to the third harmonic, the respective phase and group velocities, and the interaction length. Three examples consisting of a sine wave, a Gaussian pulse and a linearly chirped pulse are evaluated. (Author)

AD-757 221 PC$3.00/MF$0.95
RCA Labs Princeton N J
EFFECTS OF TURBULENCE INSTABILITIES ON LASER PROPAGATION.
Quarterly technical rept. no. 2, 19 Sep-15 Dec 72,
David A. de Wolf. Jan 73, 25p Rept no. PRRL-73-TR-1 RADC-TR-73-33
Contract F30602-72-C-0486, ARPA Order-1279
See also report dated Oct 72, AD-753 401.

Descriptors: (*Light transmission, Atmospheric motion), (*Coherent radiation, Focusing), Turbulence, Scintillation, Power spectra, Transfer functions, Wave functions, Resolution.
Identifiers: *Laser beams, Atmospheric attenuation.

The author reports results on Furutsu's contested theory of beam wave irradiance in turbulent air, on his attendance of the 17th General Assembly of URSI (Warsaw, Poland), on a simple model for studying feature resolution, on the log-amplitude variance for plane and spherical waves, and on the angle-of-arrival power spectrum for an interferometer. Section 2 deals exhaustively with the spherical-wave extension of the irradiance scintillation theory. (Author Modified Abstract)

AD-757 282 PC$3.00/MF$0.95
Chain Lakes Research Corp Detroit Mich
PROBLEMS ENCOUNTERED IN THE DESIGN OF A PORTABLE TRANSMISSOMETER CALIBRATOR.
Final rept. Feb 71-Oct 72,
Roger A. Keller, Sr. Oct 72, 59p FAA-RD-73-7
Contract DOT-FA71WA-2535

Descriptors: (*Optical instruments, Calibration), Test equipment, Design, Lasers, Optical equipment components, Power supplies, Wiring diagrams, Portable.
Identifiers: *Transmissometers.

A prototype portable transmissometer calibrator was designed and built using a laser as a projector source. Numerous problems were encountered during the design. Each problem is thoroughly discussed in the report. The amount of field testing performed was limited by the numerous time consuming problems. Field testing results indicate an extrapolation chart will have to be made and verified prior to using this system to calibrate a transmissometer. The system to be discussed appears quite capable of objectively calibrating a transmissometer in all types of weather. (Author)

AD-757 314 Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
TIME-RESOLVED NEAR-INFRARED EMISSION FROM A PULSED HIGH-PRESSURE CESIUM LAMP,
Stephen Levy. 31 Jan 72, 2p
Availability: Pub. in Applied Optics, v11 n12 p2983-2984 Dec 72.

Descriptors: (*Flash lamps, Cesium), Infrared radiation, Pumping (Optical).
Identifiers: Near infrared radiation.

The report describes a high-pressure cesium metal-vapor lamp developed as an efficient source of pulsed ir radiation.

N73-16498 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
FIRST-ORDER OPTICAL ANALYSIS OF A QUASI-MICROSCOPE FOR PLANETARY LANDERS.
F. O. Huck, A. R. Sinclair, and E. E. Burcher. Feb 73, 30p NASA-TN-D-7129, L-8527

Descriptors: *Cameras, *Microscopes, *Planetary landing, *Unmanned spacecraft, Angular resolution, Imaging techniques, Optical properties.

For abstract, see STAR 11 07.

20G. Particle Accelerators

ANU-P-558 PC$3.00/MF$0.95
Australian National Univ., Canberra. Dept. Of Nuclear Physics.
A.N.U. CYCLOTRON INJECTOR.
T. R. Ophel. 1972, 42p
U. S. Sales only

Descriptors: *Cyclotrons, *Van de graaff accelerators.

For abstract, see NSA 27 06, number 12642.

ANU-P-559 PC$3.00/MF$0.95
Australian National Univ., Canberra. Dept. Of Nuclear Physics.
REPORT OF COMMITTEE ON DATA ACQUISITION FACILITIES FOR THE 14UD

ACCELERATOR. PART 1. PROCESSORS AND PERIPHERALS.
R. A. I. Bell, and H. J. Hay. Aug 72, 26p
U. S. Sales only

Descriptors: *Data acquisition systems, *Van de graaff accelerators.

For abstract, see NSA 27 06, number 12676.

BNL-17293 PC$3.00/MF$0.95
Brookhaven National Lab., Upton, N. Y.
ION SOURCES FOR PROTON LINACS.
Th. Sluyters. 17 Oct 72, 21p CONF-721046-19
From Proton Linear Accelerator Conference- Los Alamos, Nm (10 Oct 1972).

Descriptors: *Hydrogen ions HK, *Ion sources, *Linear accelerators.

For abstract, see NSA 27 06, number 12643.

BNL-17311 PC$3.00/MF$0.95
Brookhaven National Lab., Upton, N. Y.
MAGNETIC CIRCUIT CONSIDERATIONS FOR HIGH FIELD MAGNETS.
J. E. Allinger, G. T. Danby, J. W. Jackson, and S. T. Lin. 1972, 5p CONF-720908-20
From 4. International Conference On Magnet Technology- Upton, Ny (19 Sep 1972).

Descriptors: *Accelerators, *Electromagnetic lenses, *Magnets.

For abstract, see NSA 27 06, number 12677.

BNL-17418 PC$3.00/MF$0.95
Brookhaven National Lab., Upton, N. Y.
NOTE ON RADIOTHERAPEUTIC USE OF PARTICLE ACCELERATOR METHODS TO DETERMINE THE STOPPING REGION.
Y. Y. Lee. 26 Oct 72, 10p

Descriptors: *Hadrons, *Radiotherapy, *Tissues.

For abstract, see NSA 27 06, number 12307.

BNL-17455 PC$3.00/MF$0.95
Brookhaven National Lab., Upton, N. Y.
INJECTION INTO THE ISA- ENERGY STACKING.
M. Month. 5 Dec 72, 15p

Descriptors: *Storage rings.

For abstract, see NSA 27 06, number 12673.

BNL-17461 PC$3.00/MF$0.95
Brookhaven National Lab., Upton, N. Y.
TOLERANCES FOR BENDING MAGNETS IN A SUPERCONDUCTING STORAGE ACCELERATOR.
G. Parzen. 5 Dec 72, 8p

Descriptors: *Storage rings.

For abstract, see NSA 27 06, number 12674.

CEA-CONF-2097 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Grenoble (France). Centre D'Etudes Nucleaires.
E.C.R. ION SOURCE FOR STRIPPED NITROGEN.
P. Apard, S. Bliman, R. Geller, B. Jacquot, and C. Jacquot. 1972, 6p CONF-720948-12
From 2. International Conference On Ion Sources- Vienna, Austria (11 Sep 1972). U. S. Sales only

Descriptors: *Ion sources, *Nitrogen ions.

For abstract, see NSA 27 06, number 12644.

CERN-TRANS-72-13 PC$3.00/MF$0.95
Gosudarstvennyi Komitet Po Ispol'Zovaniyu Atomnoi Energii Sssr, Serpukhov. Institut Fiziki Vysokikh Energii.
SYSTEM FOR FAST BEAM SPILL ONTO THE INTERNAL TARGET OF THE IHEP ACCELERATOR.
V. I. Gridasov, I. A. Danil'chenko, B. A. Zelenov, E. P. Kuznetsov, and O. V. Kurnaev. 13p
U. S. Sales only

Descriptors: *Serpukhov synchrotron.

For abstract, see NSA 27 06, number 12626.

CERN-TRANS-72-14 PC$3.00/MF$0.95
Gosudarstvennyi Komitet Po Ispol'Zovaniyu Atomnoi Energii Sssr, Serpukhov. Institut Fiziki Vysokikh Energii.
APPLICATION OF NON-LINEAR RESONANCES OF BETATRON OSCILLATIONS IN SLOW PARTICLE EJECTION FROM ACCELERATORS WITH STRONG FOCUSING.
Yu. S. Fedotov. 25p
U. S. Sales only

Descriptors: *Accelerators.

For abstract, see NSA 27 06, number 12656.

CONF-720952-3 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna, Ussr.
FORMATION AND ACCELERATION OF RINGS OF ELECTRONS-IONS BY A LARGE NUMBER OF PARTICLES.
V. S. Aleksandrov. 7p
Lang- In French. From Symposium On Collective Methods Of Acceleration- Dubna, Ussr (27 Sep 1972). U. S. Sales only

Descriptors: *Electron-ring accelerators.

For abstract, see NSA 27 06, number 12612.

JINR-P11-6561 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Computing Techniques And Automation.
CALCULATION OF ELECTROMAGNETIC FIELDS IN DOUBLE-COUPLED RESONATORS BY THE NET-POINT METHOD USING DISPLAY.
Yu. S. Derendyaev, A. A. Karlov, and N. B. Rubin. 1972, 20p
Lang- In Russian. U. S. Sales only

Descriptors: *Cavity resonators.

For abstract, see NSA 27 06, number 12659.

JINR-P9-6733 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Problems.
CLOSED ORBIT ELONGATION EFFECT IN PERIODICAL MAGNETIC FIELDS.
V. P. Dmitrievskii, V. V. Kol'ga, and N. I. Polumordvinova. 1972, 7p
Lang- In Russian. U. S. Sales only

Descriptors: *Cyclotrons, *Magnetic fields.

For abstract, see NSA 27 06, number 12657.

JPRS-58160 PC$3.00/MF$0.95
Joint Publications Research Service, Arlington, Va.
THE POSSIBILITY OF BUILDING PULSED ELECTRON ACCELERATORS WITH ENERGIES OF 20 TO 50 MEV,
G. P. Mkheidze, M. D. Raizer, M. S. Rabinovich, and A. A. Rukhadze. 6 Feb 73, 9p
Trans. of Vysokomolekulyarnye Soedineniya. Seriya B; Kratkie Soobshcheniya (USSR) n3 p67-74 Mar 73.

Descriptors: (*Electron accelerators, Design), (*Electron beams, Pulse generators), Plasma (Physics), Nuclear fusion, Quantum electrodynamics, Nuclear physics, Translations, USSR.

The report contains a study of the possibility of building pulsed electron accelerators with energies of 20 to 50 MeV, with applications to plasma physics, quantum electrodynamics, and nuclear physics.

KFK-1631 PC$3.00/MF$0.95
Kernforschungszentrum, Karlsruhe (West Germany). Institut Fuer Experimentelle Kernphysik.
COUPLING OF HIGH FREQUENCY OUTPUT IN SUPERCONDUCTING DEFLECTING RESONATORS FOR A PARTICLE SEPARATOR.
H. C. Eschelbacher. Jun 72, 95p
Lang- In German. Thesis. U. S. Sales only

Descriptors: *Beam separators.

For abstract, see NSA 27 06, number 12681.

LA-DC-72-1253 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
DELTAT TURN-ON PROCEDURE.
K. Crandall, R. A. Jameson, D. Morris, and D. Swenson. 4p CONF-721046-22
Contract W-7405-ENG-36
From Proton Linear Accelerator Conference- Los Alamos, Nm (10 Oct 1972).

Descriptors:.

For abstract, see NSA 27 06, number 12614.

LA-DC-72-1267 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
OPERATION AND PERFORMANCE OF THE HIGH-INTENSITY PROTON INJECTOR OF LAMPF.
D. W. Mueller, E. A. Meyer, R. R. Stevens Jr, B. C. Goplen, and M. A. Paciotti. 9p CONF-721046-23
Contract W-7405-ENG-36
From Proton Linear Accelerator Conference- Los Alamos, Nm (10 Oct 1972).

Descriptors:.

For abstract, see NSA 27 06, number 12645.

LA-DC-72-1288 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
CAVITY TUNING FOR THE LAMPF 805 MHZ LINAC.
G. R. Swain, R. A. Jameson, R. Kandarian, D. J. Liska, and E. R. Martin. 1972, 9p CONF-721046-18
Contract W-7405-ENG-36
From Proton Linear Accelerator Conference- Los Alamos, Nm (10 Oct 1972).

Descriptors:.

For abstract, see NSA 27 06, number 12627.

LA-DC-72-1289 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
AUTOMATED ADMITTANCE MEASUREMENT AT LAMPF.
J. E. Stovall. 1971, 6p CONF-721046-17
Contract W-7405-ENG-36
From Proton Linear Accelerator Conference- Los Alamos, Nm (10 Oct 1972).

Descriptors:.

For abstract, see NSA 27 06, number 12660.

LA-DC-72-1301 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
COMPUTER CONTROL OF LAMPF'S 201.25 MHZ RF.
R. A. Dehaven. 1972, 7p CONF-721046-14
Contract W-7405-ENG-36
From Proton Linear Accelerator Conference- Los Alamos, Nm (10 Oct 1972).

Descriptors:.

For abstract, see NSA 27 06, number 12628.

LA-DC-72-1309 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
BEAM TRANSPORT STUDIES ON THE PROTON BEAM LINE IN THE INJECTOR COMPLEX OF LAMPF.
R. R. Stevens Jr, B. Goplen, and J. Stovall. 1972, 8p CONF-721046-16
Contract W-7405-ENG-36
From Proton Linear Accelerator Conference- Los Alamos, Nm (10 Oct 1972).

Descriptors:.

For abstract, see NSA 27 06, number 12646.

LA-DC-72-1310 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
CONSTRUCTION OF ALUMINA INSULATED BENDING MAGNETS FOR LAMPF.
E. D. Bush Jr, and R. L. Rhorer. 1972, 9p
CONF-721046-13
Contract W-7405-ENG-36
From Proton Linear Accelerator Conference- Los Alamos, Nm (10 Oct 1972).

Descriptors: *Magnets.

For abstract, see NSA 27 06, number 12629.

LA-DC-72-1391 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
STATUS OF LAMPF.
L. Rosen. 8p CONF-721124-1
Contract W-7405-ENG-36
From 6. Lampf Users Group Meeting- Los Alamos, Nm (13 Nov 1972).

Descriptors:.

For abstract, see NSA 27 06, number 12615.

LA-5126 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
MAGNET ALIGNMENT STUDY FOR THE LAMPF BIOMEDICAL PION CHANNEL.
R. L. Hutson. Jan 73, 9p
Contract W-7405-ENG-36

Descriptors:.

For abstract, see NSA 27 06, number 12682.

LBL-1070 PC$3.00/MF$0.95
California Univ., Berkeley. Lawrence Berkeley Lab.
LONGITUDINAL COUPLING IMPEDANCE OF A STATIONARY ELECTRON RING IN A CYLINDRICAL GEOMETRY.
Andris Faltens, and L. J. Laslett. Sep 72, 20p
CONF-720952-2
Contract W-7405-ENG-48
From Symposium On Collective Methods Of Acceleration- Dubna, Ussr (27 Sep 1972).

Descriptors: *Electron-ring accelerators.

For abstract, see NSA 27 06, number 12617.

LBL-1222 PC$3.00/MF$0.95
California Univ., Berkeley. Lawrence Berkeley Lab.
EDGE COOLED TAPE MAGNET COILS FOR HIGH CURRENT DENSITY APPLICATIONS.
R. M. Main, and Roland Yourd. Oct 72, 19p
CONF-720908-29
Contract W-7405-ENG-48
From 4. International Conference On Magnet Technology- Upton, Ny (19 Sep 1972).

Descriptors: *Electromagnetic lenses, *Linear accelerators, *Magnet coils.

For abstract, see NSA 27 06, number 12686.

LBL-1311 PC$3.00/MF$0.95
California Univ., Berkeley. Lawrence Berkeley Lab.
COMPUTER-CONTROLLED, 3-D MAGNETIC FIELD MAPPING SYSTEM.
C. G. Dols. Sep 72, 10p CONF-720908-25
Contract W-7405-ENG-48
From 4. International Conference On Magnet Technology- Upton, Ny (19 Sep 1972).

Descriptors: *Accelerators, *Magnetic fields.

For abstract, see NSA 27 06, number 12630.

LBL-1329 PC$3.00/MF$0.95
California Univ., Berkeley. Lawrence Berkeley Lab.
SUPER-HILAC VACUUM SYSTEM.
K. M. Mirk. Oct 72, 13p CONF-721046-24
Contract W-7405-ENG-48
From Proton Linear Accelerator Conference- Los Alamos, Nm (10 Oct 1972).

Descriptors: *Linear accelerators.

For abstract, see NSA 27 06, number 12631.

LBL-906 PC$3.00/MF$0.95
California Univ., Berkeley. Lawrence Berkeley Lab.
ASSESSING AND CONTROLLING EDDY-CURRENTS IN CONDUCTORS OF FAST-PULSED COILS.
R. T. Avery, and L. J. Laslett. Sep 72, 7p
CONF-720908-24
Contract W-7405-ENG-48
From 4. International Conference On Magnet Technology- Upton, Ny (19 Sep 1972).

Descriptors: *Electron-ring accelerators, *Magnet coils.

For abstract, see NSA 27 06, number 12661.

LBL-912 PC$3.00/MF$0.95
California Univ., Berkeley. Lawrence Berkeley Lab.
BEAM EXTRACTION FOCUSING COILS FOR THE BEVATRON.
Egon Hoyer. Sep 72, 10p CONF-720908-28
Contract W-7405-ENG-48
From 4. International Conference On Magnet Technology- Upton, Ny (19 Sep 1972).

Descriptors: *Bevatron.

For abstract, see NSA 27 06, number 12647.

LBL-905 PC$3.00/MF$0.95
California Univ., Berkeley. Lawrence Berkeley Lab.
CORNER SEPTUM MAGNET FOR MULTI--TURN INJECTION.
R. T. Avery, and P. F. Meads Jr. Sep 72, 4p
CONF-720908-27
Contract W-7405-ENG-48
From 4. International Conference On Magnet Technology, Upton, Ny (19 Sep 1972).

Descriptors: *Magnets, *Storage rings.

For abstract, see NSA 27 06, number 12675.

N73-16677 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
MAGNETIC-FIELD MEASUREMENTS FOR THE LEWIS RESEARCH CENTER CYCLOTRON.
T. E. Fessler. Feb 73, 52p NASA-TM-X-2692, E-6956

Descriptors: *Cyclotrons, *Magnetic fields, *Magnetic measurement, Computer programs, Hall effect, Magnetic coils, Temperature compensation, Transducers.

For abstract, see STAR 11 07.

SLAC-TRANS-148 PC$3.00/MF$0.95
STUDY OF THE STOCHASTIC INSTABILITY OF THE BETATRON OSCILLATIONS OF AN ELECTRON BEAM IN A STORAGE RING.
G. N. Kulipanov, S. I. Mishnev, and A. N. Skrinskii. 51p

Descriptors: *Storage rings.

For abstract, see NSA 27 06, number 12662.

20H. Particle Physics

AD-757 587 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
ELASTIC ELECTRON-DEUTERON SCATTERING MEASUREMENTS AND THE NEUTRON CHARGE FORM FACTOR AT VERY LOW MOMENTUM TRANSFERS.
Doctoral thesis,
Robert Leavy Topping. Dec 72, 154p

Descriptors: (*Deuteron reactions, Elastic scattering), (*Neutron scattering, Nuclear moments), Electron beams, Differential cross section, Wave functions, Proton scattering, Nuclear energy levels, Linear accelerators, Computer programs, Theses.
Identifiers: Electron scattering, Form factors, FORTRAN.

Seventy-five measurements of the differential elastic electron-deuteron scattering cross section were made for values of (q sup 2) ranging from 0.05 to 0.35 (fm sup -2) at the NPS LINAC with electron scattering angles of 60 degrees to 120 degrees. The charge radius of the deuteron was determined to be (r sub (E sub d) = 1.9641 plus or minus 0.0074 fm. Values of the neutron charge from factors were calculated using Lomon-Feshbach Model 1,5, and 15 relativistic corrections to the deuteron save functions. (Author Modified Abstract)

AERE-R-6862 (REV.) PC$3.00/MF$0.95
Atomic Energy Research Establishment, Harwell (England).
ABSOLUTE YIELDS IN THE FISSION OF /SUP 235/U, /SUP 238/U, AND /SUP 239/PU IRRADIATED IN DFR.
J. G. Cuninghame, J. A. B. Goodall, and H. H. Willis. May 72, 17p
U. S. Sales only

Descriptors: *Fission products, *Plutonium isotopes pu- 9, *Uranium isotopes u- 5, *Uranium isotopes u- 8.

For abstract, see NSA 27 06, number 13546.

ANL/HEP-7254 PC$3.00/MF$0.95
Argonne National Lab., Ill.
MESON RESONANCES.
R. Diebold. Nov 72, 72p CONF-720954-10
From 16. International Conference On High Energy Physics- Batavia, Il (6 Sep 1972).

Descriptors: *Mesons/ resonance.

For abstract, see NSA 27 06, number 13082.

ANU-P-549 PC$3.00/MF$0.95
Australian National Univ., Canberra. Dept. Of Nuclear Physics.
EXCITED STATES OF /SUP 16/O BETWEEN 13.5 AND 15.0 MEV.
P. Martin, and T. R. Ophel. 1972, 13p
U. S. Sales only

Descriptors: *Alpha particles, *Carbon isotopes c-12, *Oxygen isotopes o-16.

For abstract, see NSA 27 06, number 13408.

ANU-P-554 PC$3.00/MF$0.95
Australian National Univ., Canberra. Dept. Of Nuclear Physics.
/SUP 36/AR (ALPHA,GAMMAO)/SUP 40/CA REACTION AT EXCITATION ENERGIES IN THE REGION OF THE GIANT DIPOLE RESONANCE.
R. B. Watson, D. Branford, J. L. Black, and W. J. Caelli. 1972, 24p
U. S. Sales only

Descriptors: *Alpha particles, *Argon isotopes ar-36, *Calcium isotopes ca-40.

For abstract, see NSA 27 06, number 13459.

ANU-P-556 PC$3.00/MF$0.95
Australian National Univ., Canberra. Dept. Of Nuclear Physics.
5.80 MEV STATE OF /SUP 32/S.
P. R. Gardner, C. E. Moss, R. H. Spear, and L. E. Carlson. 1972, 21p
U. S. Sales only

Descriptors: *Sulfur isotopes s- .

For abstract, see NSA 27 06, number 13444.

ANU-P-561 PC$3.00/MF$0.95
Australian National Univ., Canberra. Inst. Of Advanced Studies.
GAMMA-RAY DECAY SCHEMES OF LEVELS AT INTERMEDIATE ENERGIES IN /SUP 32/S.
C. E. Moss, R. H. Spear, F. Ahmad, A. M. Baxter, and L. E. Carlson. 1972, 14p
U. S. Sales only

Descriptors: *Sulfur isotopes s- .

For abstract, see NSA 27 06, number 13445.

AREAEE-148 PC$3.00/MF$0.95
Atomic Energy Establishment, Cairo (Egypt). Nuclear Physics Dept.
NUCLEAR STATISTICAL FLUCTUATION PROGRAM (NCFL).
M. N. H. Comsan. 1972, 36p
U. S. Sales only

Descriptors: *Computer programs, *Nuclear reactions.

For abstract, see NSA 27 06, number 13569.

BARC-635 PC$3.00/MF$0.95
Bhabha Atomic Research Centre, Bombay (India).
STUDY OF CLUSTER KNOCK-OUT REACTIONS ON LITHIUM ISOTOPES.
A. K. Jain. 1972, 125p
U. S. Sales only

Descriptors: *Electrons, *Lithium isotopes li-6, *Lithium isotopes li-7, *Protons.

For abstract, see NSA 27 06, number 13570.

BNL-TR-516 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr).
NUCLEAR REACTIONS INDUCED BY XENON IONS AND THE PRODUCTION OF SUPER-HEAVY ELEMENTS.
G. N. Flerov, and Yu. Ts. Oganesyan. 30p

Descriptors: *Fission fragments, *Ions, *Nuclei, *Radiation detectors/ dielectric track, *Radiation detectors/ ionization chamber, *Tantalum isotopes ta- 8 , *Transactinide elements, *Uranium isotopes u- 8, *Xenon isotopes xe- 6.

For abstract, see NSA 27 06, number 13547.

BNL-17271 PC$3.00/MF$0.95
Brookhaven National Lab., Upton, N. Y.
CURRENT STATUS OF MEASUREMENTS OF GROUND STATE MOMENTS OF NUCLEI.
V. W. Cohen. 1972, 42p CONF-720932-4
From International Conference On Nuclear Moments And Nuclear Structure- Osaka, Japan (4 Sep 1972).

Descriptors: *Nuclear electric moments, *Nuclear magnetic moments.

For abstract, see NSA 27 06, number 13484.

BNL-17469 PC$3.00/MF$0.95
Brookhaven National Lab., Upton, N. Y.
HYPERON PHYSICS FOR PEDESTRIANS.
Jay Marx. 30 Nov 72, 24p

Descriptors: *Hyperons, *Protons, *Synchrotrons.

For abstract, see NSA 27 06, number 13167.

CERN-HERA-72-2 PC$3.00/MF$0.95
European Organization For Nuclear Research, Geneva (Switzerland).
COMPILATION OF CROSS SECTIONS I-K/SUP -/ AND K/SUP +/ INDUCED REACTIONS.
E. Bracci, J. P. Droulez, E. Flaminio, J. D. Hansen, and D. R. O. Morrison. 1972, 196p
U. S. Sales only

Descriptors: *Deuterons, *Mesons KK, *Mesons KJ, *Neutrons, *Protons.

For abstract, see NSA 27 06, number 13083.

CONF-720309 PC$6.00/MF$0.95
Argonne National Lab., Ill.
SYMPOSIUM ON TWO-NUCLEON TRANSFER AND PAIRING EXCITATIONS, ARGONNE NATIONAL LABORATORY, ILLINOIS, MARCH 20-21, 1972.
1972, 419p
Contract W-31-109-ENG-38

Descriptors: *Nuclear reactions.

For abstract, see NSA 27 06, number 13571.

CONF-720954-8 PC$3.00/MF$0.95
Bergen Univ. (Norway). Dept. Of Physics.
CHARGED-PARTICLE PRODUCTION AT ISR. TECHNICAL REPORT NO. 47.
Endre Lillethun. Nov 72, 28p
From 16. International Conference On High Energy Physics- Batavia, Il (6 Sep 1972). U. S. Sales only

Descriptors: *Protons, *Storage rings.

For abstract, see NSA 27 06, number 13056.

CONF-721127-1 PC$3.00/MF$0.95
Oak Ridge National Lab., Tenn.
ORELA MEASUREMENTS OF THE /SUP 235/U (N,F) CROSS SECTION TO 100 KEV.
R. W. Peelle. 1972, 9p
From 2. Iaea Panel On Neutron Standards Reference Data- Vienna, Austria (20 Nov 1972).

Descriptors: *Neutrons/ fast, *Neutrons/ intermediate, *Uranium isotopes u- 5.

For abstract, see NSA 27 06, number 13548.

COO-1764-149 PC$3.00/MF$0.95
Deutsches Elektronen-Synchrotron, Hamburg (West Germany).
SELF-TRAPPING FIELD OF QUARKS IN HADRONS.
H. Suura. Feb 72, 9p DESY-72/7

Descriptors: *Hadrons, *Quarks.

For abstract, see NSA 27 06, number 13184.

COO-1764-151 PC$3.00/MF$0.95
Deutsches Elektronen-Synchrotron, Hamburg (West Germany).
QUARK LOOP DYNAMICS AND MESON DECAYS.
H. Suura, and Bing-lin Young. Feb 72, 30p
DESY-72/3

Descriptors: *Elementary particle models, *Mesons, *Mesons/ resonance, *Quarks, *Symmetry groups.

For abstract, see NSA 27 06, number 13130.

COO-1764-152 PC$3.00/MF$0.95
Deutsches Elektronen-Synchrotron, Hamburg (West Germany).
TESTING TRIPLET MODELS.
H. Suura, T. F. Walsh, and B. L. Young. May 72, 10p DESY-72/21

Descriptors: *Elementary particle models, *Mesons.

For abstract, see NSA 27 06, number 13131.

COO-1764-154 PC$3.00/MF$0.95
Florida State Univ., Tallahassee. Dept. Of Physics. Minnesota Univ., Minneapolis. School Of Physics.
HIGH-LYING NEUTRON-HOLE STATES POPULATED IN THE REACTION /SUP 13/C (P,D)/SUP 12/C AT 62 MEV.
L. J. Parish, R. A. Brown, K. A. Eberhard, A. Richter, and W. Von Witsch. 1972, 21p

Descriptors: *Carbon isotopes c-12, *Carbon isotopes c-13, *Protons.

For abstract, see NSA 27 06, number 13410.

COO-1764-155 PC$3.00/MF$0.95
Minnesota Univ., Minneapolis. School Of Physics And Astronomy.
RESONANCE DECAYS INVOLVING TWO PARTIAL WAVES.
W. P. Petersen, and J. L. Rosner. Feb 72, 13p
CALT-68-352
Contract AT (11-1)-1764

Descriptors: *Baryons/ resonance M, *Baryons/ resonance N, *Baryons/ resonance N, *Baryons/ resonance Z, *Mesons KK, *Mesons, *Nucleons, *Protons, *Symmetry groups.

For abstract, see NSA 27 06, number 13282.

COO-1764-156 PC$3.00/MF$0.95
Minnesota Univ., Minneapolis. School Of Physics And Astronomy.
SYMMETRIES AND NONSYMMETRIES OF THE RELATIVISTIC QUARK MODEL.
J. L. Rosner. 1 May 72, 58p
Contract AT (11-1)-1764

Descriptors: *Elementary particle models, *Mesons/ resonance, *Symmetry groups.

For abstract, see NSA 27 06, number 13283.

COO-1764-157 PC$3.00/MF$0.95
Minnesota Univ., Minneapolis. School Of Physics And Astronomy.

COMPULSORY RESONANCE FORMATION.
J. L. Rosner. 1972, 10p
Contract AT (11-1)-1764

Descriptors: *Baryons/ resonance, *Elementary particles, *Hadrons, *Mesons/ resonance.

For abstract, see NSA 27 06, number 13185.

COO-1764-158 PC$3.00/MF$0.95
Minnesota Univ., Minneapolis. School Of Physics And Astronomy.
SPECTROSCOPIC CONSEQUENCES OF EXACT DUALITY FOR BARYONS.
J. L. Rosner. 1972, 47p
Contract AT (11-1)-1764

Descriptors: *Baryons, *Baryons ANTIPARTICLES, *Baryons/ resonance, *Mesons.

For abstract, see NSA 27 06, number 13204.

COO-1764-159 PC$3.00/MF$0.95
Minnesota Univ., Minneapolis. School Of Physics And Astronomy.
RESONANCE DECAYS INVOLVING VECTOR MESONS.
W. P. Petersen, and J. L. Rosner. Aug 72, 11p
Contract AT (11-1)-1764

Descriptors: *Baryons/ resonance M, *Baryons/ resonance N, *Mesons, *Nucleons.

For abstract, see NSA 27 06, number 13225.

COO-1764-160 PC$3.00/MF$0.95
Minnesota Univ., Minneapolis. School Of Physics And Astronomy.
TWO PION INTERMEDIATE STATES IN THE DECAY K/SUB S//SUP 0/ YIELDS 2GAMMA.
R. L. Goble. 1972, 9p
Contract AT (11-1)-1764

Descriptors: *Mesons K.

For abstract, see NSA 27 06, number 13132.

COO-1764-167 PC$3.00/MF$0.95
Minnesota Univ., Minneapolis. School Of Physics.
NON-LOCAL AND MAJORANA-EXCHANGE TERMS IN THE OPTICAL MODEL.
G. W. Greenlees, W. Makofske, Y. C. Tang, and D. R. Thompson. 1972, 23p
Contract AT (11-1)-1265

Descriptors: *Calcium isotopes ca-40, *Protons.

For abstract, see NSA 27 06, number 13461.

COO-1764-175 PC$3.00/MF$0.95
Niels Bohr Institutet, Copenhagen (Denmark).
COMPARISON OF PION MOMENTUM DISTRIBUTIONS IN 19-GEV/C PP COLLISIONS WITH AND WITHOUT STRANGE-PARTICLE PRODUCTION.
Erwin Marquit. Jun 72, 12p

Descriptors: *Mesons K, *Protons.

For abstract, see NSA 27 06, number 13057.

COO-2130-29 PC$3.00/MF$0.95
Kansas State Univ., Manhattan (Usa). Nuclear Labs.
ATOMIC AND NUCLEAR PHYSICS STUDIES WITH ACCELERATORS.
R. B. Leachman. Apr 72, 125p
Contract AT (11-1)-2130

Descriptors: *Nuclear reactions, *Particle accelerators.

For abstract, see NSA 27 06, number 13450.

COO-2197-7 PC$3.00/MF$0.95
Wyoming Univ., Laramie.
PION-NUCLEON INTERACTION AND MESONIC ATOMS. PROGRESS REPORT, FEBRUARY 1, 1972-JANUARY 31, 1973.
G. A. Rebka Jr, and Raymond Kunselman. 1972, 8p
Contract AT (11-1)-2197

Descriptors: *Mesic atoms, *Mesons K, *Protons.

For abstract, see NSA 27 06, number 13084.

COO-2220-5 PC$3.00/MF$0.95
Institute For Advanced Study, Princeton, N. J.
HIGHER SYMMETRIES AND BARYON RESONANCES.
J. L. Rosner. 17p CONF-720954-3
Contract AT (11-1)-2220
From 16. International Conference On High Energy Physics- Batavia, Il (6 Sep 1972).

Descriptors: *Baryons/ resonance, *Symmetry groups.

For abstract, see NSA 27 06, number 13284.

COO-3023-15 PC$3.00/MF$0.95
Massachusetts Inst. Of Tech., Cambridge.
RECOIL PROTON POLARIZATION IN NEUTRAL PION PHOTOPRODUCTION BETWEEN 1000 AND 1800 MEV.
N. Tanaka, M. M. Castro, R. H. Milburn, W. B. Richards, and J. P. Rutherfoord. Jul 72, 23p CONF-720954-5
Contract AT (11-1)-3023
From 16. International Conference On High Energy Physics- Batavia, Il (6 Sep 1972).

Descriptors: *Mesons, *Photons, *Protons.

For abstract, see NSA 27 06, number 13016.

COO-3065-23 PC$3.00/MF$0.95
Michigan Univ., Ann Arbor.
MEASUREMENT OF THE CHARGED-PARTICLE MULTIPLICITY IN PP COLLISIONS AT 102 GEV/C.
J. W. Chapman, N. Green, and C. M. Bromberg. 31 Aug 72, 10p CONF-720954-7, UR-395 UMBC--72-11
Contract AT (11-1)-3065
From 16. International Conference On High Energy Physics- Batavia, Il (6 Sep 1972).

Descriptors: *Protons.

For abstract, see NSA 27 06, number 13058.

DESY-72/55 PC$3.00/MF$0.95
Deutsches Elektronen-Synchrotron, Hamburg (West Germany).
FURTHER REMARKS ABOUT THE EPSILON (700) MESON AND BROKEN SCALE INVARIANCE.
B. Renner, and L. P. Staunton. Sep 72, 11p
U. S. Sales only

Descriptors: *Invariance principles, *Mesons, *Mesons/ resonance ETA.

For abstract, see NSA 27 06, number 13205.

EANDC (E)-150-U (SUPPL.) PC$3.00/MF$0.95
European American Nuclear Data Committee.
PROGRESS REPORT ON NUCLEAR DATA RESEARCH IN THE EURATOM COMMUNITY FOR THE PERIOD JANUARY 1 TO DECEMBER 31, 1971.
Oct 72, 41p
U. S. Sales only

Descriptors: *Neutron reactions, *Radioactive isotopes.

For abstract, see NSA 27 06, number 13380.

FEI-293 PC$3.00/MF$0.95
Gosudarstvennyi Komitet Po Ispol'Zovaniyu Atomnoi Energii Sssr, Obninsk. Fiziko-Tekhnicheskii Institut.
CALCULATIONS OF CROSS SECTIONS OF RADIATIVE CAPTURE OF FAST NEUTRONS IN ACCORDANCE WITH THE STATISTICAL THEORY OF NUCLEAR REACTIONS.
A. G. Dovbenko, A. V. Ignatyuk, and V. A. Tolstikov. 1971, 22p
Lang- In Russian. U. S. Sales only

Descriptors: *Neutrons/ fast, *Nuclei.

For abstract, see NSA 27 06, number 13583.

GWI-PH-1/72 PC$3.00/MF$0.95
Uppsala Univ. (Sweden). Gustaf Werner Inst.
DATA ANALYSIS IN A COUNTER EXPERIMENT AT THE CERN PS, USING A HELIUM RECOIL SPECTROMETER.
Tord Ekeloef. May 72, 38p
U. S. Sales only

Descriptors: *Helium isotopes he-4, *Mesons K.

For abstract, see NSA 27 06, number 13085.

HEDL-TME-71-154 PC$3.00/MF$0.95
Hanford Engineering Development Lab., Richland, Wash.
OPTICAL MODEL STUDIES FOR FAST NEUTRON CAPTURE CROSS SECTION CALCULATIONS.
A. D. Mackellar, and R. E. Schenter. Aug 72, 37p ENDF-160
Contract AT (45-1)-2170

Descriptors: *Fission products, *Neutrons/ fast, *Nuclei.

For abstract, see NSA 27 06, number 13584.

IAE-2134 PC$3.00/MF$0.95
Institut Atomnoi Energii, Moscow (Ussr).
ANALYTICAL SOLUTION OF A SYSTEM OF MANY-GROUP DIFFUSION EQUATIONS.
S. S. Gorodkov. 1971, 15p
Lang- In Russian. U. S. Sales only

Descriptors: *Neutrons.

For abstract, see NSA 27 06, number 13382.

IC-72/151 PC$3.00/MF$0.95
International Centre For Theoretical Physics, Trieste (Italy).
MASS DISPERSION RELATIONS AND E/SUP +/-E/SUP -/ COLLISIONS IN THE PHYSICS OF THE LIGHT CONE.
G. Preparata. Dec 72, 71p
U. S. Sales only

Descriptors: *Electrons, *Positrons.

For abstract, see NSA 27 06, number 13133.

INR-P-1408 PC$3.00/MF$0.95
Institute Of Nuclear Research, Warsaw (Poland).
ON THE ROLE OF THE GAMMA-DECAY OF UNBOUND NUCLEAR STATES IN THE NUCLEON INDUCED REACTIONS.
Piotr Decowski, Witold Grochulski, and Andrzej Marcinkowski. 1972, 44p
U. S. Sales only

Descriptors: *Nuclear reactions.

For abstract, see NSA 27 06, number 13585.

IPNO/TH-72-30 PC$3.00/MF$0.95
Paris Univ., Orsay (France). Institut De Physique Nucleaire.
ENERGY DENSITY FORMALISM AND THE SHELL STRUCTURE OF NUCLEI.
R. J. Lombard. Oct 72, 14p CONF-720933-4
From Symposium On Present Status And Novel Developments In The Nuclear Many-body Problem- Rome, Italy (19 Sep 1972). U. S. Sales only

Descriptors: *Nuclear models, *Nuclear structure, *Nuclear theory.

For abstract, see NSA 27 06, number 13586.

IS-T-535 PC$3.00/MF$0.95
Ames Lab., Iowa.
DECAY ENERGIES OF GASEOUS FISSION PRODUCTS AND THEIR DAUGHTERS FOR A- 88 TO 93.
J. R. Clifford. Nov 72, 101p
Contract W-7405-ENG-82
Thesis.

Descriptors: *Fission products, *Radioactive decay.

For abstract, see NSA 27 06, number 13488.

IS-T-544 PC$3.00/MF$0.95
Ames Lab., Iowa.
PHOTOFISSION CROSS SECTIONS OF /SUP 238/U AND /SUP 235/U FROM 5.0 MEV TO 8.0 MEV.
R. A. Anderl. Nov 72, 117p
Contract W-7405-ENG-82
Thesis.

Descriptors: *Photons, *Uranium isotopes u- 5, *Uranium isotopes u- 8.

For abstract, see NSA 27 06, number 13549.

JINR-E1-6598 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of High Energy.
COHERENT PRODUCTION OF PARTICLES FROM EMULSION NUCLEI BETWEEN 17 AND 67 GEV/C.
R. Khoshmukhamedov, G. S. Shabratova, and K. D. Tolstov. 1972, 9p
U. S. Sales only

Descriptors: *Mesons K, *Nuclear emulsions, *Nuclei, *Protons.

For abstract, see NSA 27 06, number 13086.

JINR-E1-6704 PC$3.00/MF$0.95
INVESTIGATION OF MULTIBARYONIC RESONANCES WITH STRANGENESS EQUAL TO AND DIFFERENT FROM ZERO.
B. A. Shakhbazyan, A. A. Timonina, and N. A. Kalinina. 1972, 16p
U. S. Sales only

Descriptors: *Baryons/ resonance, *Carbon isotopes, *Mesons K, *Neutrons.

For abstract, see NSA 27 06, number 13059.

JINR-E1-6743 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of High Energy.
TOTAL ELASTIC P-P, P-D, P-N, CROSS SECTIONS IN THE ENERGY RANGE OF 1 TO 70 GEV.
G. G. Beznogikh, A. Buyak, V. A. Nikitin, M. G. Shafranova, and V. A. Sviridov. 1972, 12p
U. S. Sales only

Descriptors: *Deuterons, *Neutrons, *Protons.

For abstract, see NSA 27 06, number 13060.

JINR-E1-6753 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Problems.
PIPI-SCATTERING LENGTHS A/SUB 0/ AND A/SUB 2/ FROM THE ANALYSIS OF TAU DECAYS.
S. A. Bunyatov, G. R. Gulkanyan, and V. S. Kurbatov. 1972, 8p
U. S. Sales only

Descriptors: *Mesons KK, *Mesons KJ, *Mesons.

For abstract, see NSA 27 06, number 13206.

JINR-E13-6659 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of High Energy.
MAGNETIC MEASUREMENTS FOR PI/SUP -/-E EXPERIMENT AT 50 GEV.
V. Gaevski, Z. Guzik, and A. D. Kirillov. 1972, 12p
U. S. Sales only

Descriptors: *Electrons, *Mesons, *Mesons K.

For abstract, see NSA 27 06, number 13017.

JINR-E2-6697 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
INTERPRETATION OF HIGH ENERGY INELASTIC INTERACTIONS OF PIONS WITH HEAVY EMULSION NUCLEI.
S. M. Eliseev, and Dzh. M. Kokhli. 1972, 24p
U. S. Sales only

Descriptors: *Mesons, *Nuclei/ heavy.

For abstract, see NSA 27 06, number 13587.

JINR-E2-6706 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
MONTE CARLO CALCULATIONS OF REACTIONS INDUCED BY HIGH-ENERGY PARTICLES AND RELATIVISTIC NUCLEI.
V. S. Barashenkov, K. K. Gudima, F. G. Zheregi, A. S. Il'inov, and V. D. Toneev. 1972, 50p
U. S. Sales only

Descriptors: *Fission, *Nuclear reactions.

For abstract, see NSA 27 06, number 13588.

JINR-E2-6722 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
SUM RULES FOR THE PHOTON-LEPTON INTERACTION CROSS-SECTIONS.
S. B. Gerasimov, and Zh. Mulen. 1972, 12p
U. S. Sales only

Descriptors: *Atoms, *Electrons, *Leptons, *Leptons/ heavy, *Muons, *Photons.

For abstract, see NSA 27 06, number 13168.

JINR-E2-6763 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
ESSENTIAL SELFADJOINTNESS OF DIFFERENT ALGEBRAS OF FIELD OPERATORS.
G. Lassner, and W. Timmermann. 1972, 8p
U. S. Sales only

Descriptors: *Current algebra.

For abstract, see NSA 27 06, number 13116.

JINR-E2-6765 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
DISPERSION CALCULATION OF THE REAL PART OF THE FORWARD PI /SUP 4/HE ELASTIC SCATTERING AMPLITUDE.
S. Dubichka. 1972, 16p
U. S. Sales only

Descriptors: *Helium isotopes he-4, *Mesons.

For abstract, see NSA 27 06, number 13589.

JINR-E2-6792 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
AUTOMODEL AND ON MASS SHELL ASYMPTOTICS ACCORDING TO THE DYSON-JOST-LEHMANN REPRESENTATION.
V. A. Matveev, D. Robashik, A. N. Tavkhelidze, and E. Vitsorek. 1972, 28p
U. S. Sales only

Descriptors: *Electrons, *Protons.

For abstract, see NSA 27 06, number 13134.

JINR-E2-6803 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
PIN-SCATTERING AT HIGH ENERGIES IN THE QUASIPOTENTIAL APPROACH.
M. I. Dzhgarkava, V. R. Garsevanishvili, S. V. Goloskokov, Yu. M. Kazarinov, and V. A. Matveev. 1972, 48p
U. S. Sales only

Descriptors: *Mesons J, *Protons.

For abstract, see NSA 27 06, number 13226.

JINR-E4-6630 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
STUDY OF HIGHLY EXCITED STATES BY MEANS OF A MODEL WITH MULTIPOLE AND SPIN-MULTIPOLE FORCES.
V. G. Solov'ev. 1972, 28p
U. S. Sales only

Descriptors: *Nuclear structure.

For abstract, see NSA 27 06, number 13590.

JINR-E4-6663 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
NONROTATIONAL STATES OF SOME TRANSCURIUM ELEMENTS.
S. P. Ivanova, A. L. Komov, L. A. Malov, and V. G. Soloviev. 1972, 26p
U. S. Sales only

Descriptors: *Nuclear structure, *Transuranium elements.

For abstract, see NSA 27 06, number 13591.

JINR-E4-6783 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
POSITIVE ENERGY BOUND STATES OF NONLOCAL SEPARABLE POTENTIALS.
P. Beregi. 1972, 16p
U. S. Sales only

Descriptors: *Nuclear reactions, *Nuclear theory.

For abstract, see NSA 27 06, number 13592.

JINR-E7-6721 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Reactions.
LIFETIMES OF ROTATIONAL STATES IN /SUP 164/YB AND /SUP 162/YB.
B. Bochev, S. A. Karamyan, T. Kutsarova, E. Nadzhakov, and Ts. Venkova. 1972, 14p

U. S. Sales only

Descriptors: *Ytterbium isotopes yb- 6 .

For abstract, see NSA 27 06, number 13517.

JINR-E7-6764 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Reactions.
MULTINUCLEON TRANSFER REACTIONS IN THE /SUP 232/TH + /SUP 22/NE SYSTEM.
A. G. Artyukh, G. F. Gridnev, V. L. Mikheev, V. V. Volkov, and Ya. Vil'chinski. 1972, 16p
U. S. Sales only

Descriptors: *Neon isotopes ne-22, *Thorium isotopes th- .

For abstract, see NSA 27 06, number 13550.

JINR-P1-6770 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of High Energy.
DETERMINATION OF THE AVERAGE MULTIPLICITY OF CHARGED PARTICLES IN P-P INTERACTIONS AT 35 GEV/C.
I. V. Boguslavskii, N. M. Viryasov, and S. Vyskochil. 1972, 8p
Lang- In Russian. U. S. Sales only

Descriptors: *Protons.

For abstract, see NSA 27 06, number 13061.

JINR-P13-6784 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Neutron Physics.
TECHNIQUE OF MEASUREMENT OF EPITHERMAL NEUTRON BACKGROUND IN EXPERIMENTS ON THERMAL NEUTRON SCATTERING.
B. N. Savenko, K. Fel'dmann, and K. Hennig. 1972, 8p
Lang- In Russian. U. S. Sales only

Descriptors: *Neutrons/ epithermal, *Neutrons/ thermal, *Radiation detectors.

For abstract, see NSA 27 06, number 12004.

JINR-P15-6771 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Neutron Physics.
STUDY OF THE REACTION /SUP 11/B (P,3ALPHA).
K. Dzhanobilov, V. V. Komarov, M. S. El Tahavi, Kh. R. Saad, and I. V. Sizov. 1972, 20p
Lang- In Russian. U. S. Sales only

Descriptors: *Boron isotopes b-11, *Protons.

For abstract, see NSA 27 06, number 13411.

JINR-P2-6639 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
ELECTROMAGNETIC INTERACTION IN SU (3) X SU (3) SYMMETRY AND PSEUDOSCALAR MESON DECAYS.
B. M. Zupnik, and E. A. Ivanov. 1972, 23p
Lang- In Russian. U. S. Sales only

Descriptors: *Mesons ETA, *Mesons/ pseudoscalar, *Symmetry groups.

For abstract, see NSA 27 06, number 13275.

JINR-P2-6677 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
PROBLEM OF THE H YIELDS 0 LIMIT IN A QUASIPOTENTIAL EQUATION.
V. R. Garsevanishvili, S. V. Goloskokov, V. A. Matveev, and L. A. Slepchenko. 1972, 8p
Lang- In Russian. U. S. Sales only

Descriptors: *Elementary particles, *Hadrons.

For abstract, see NSA 27 06, number 13186.

JINR-P4-6719 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
INTRINSIC-EXCITATION-COUPLED-TO-ROTATOR-MODEL (IECRM) FOR ODD-MASS NUCLEI.
I. N. Mikhailov, D. Karadzhov, and M. O. Shaker. 1972, 14p
Lang- In Russian. U. S. Sales only

Descriptors: *Nuclear structure.

For abstract, see NSA 27 06, number 13593.

JINR-P6-6651 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Problems.
/SUP 137/CE LEVEL POPULATION BY ELECTRON CAPTURE AND POSITRON EMISSION AT /SUP 137/PR DECAY.
V. S. Buttsev, K. Ya. Gromov, V. G. Kalinnikov, V. A. Morozov, and T. M. Muminov. 1972, 20p
Lang- In Russian. U. S. Sales only

Descriptors: *Cerium isotopes ce-137, *Praseodymium isotopes pr- 7.

For abstract, see NSA 27 06, number 13489.

JINR-P6-6723 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Reactions.
EXCITATION OF THREE-PARTICLE STATES IN /SUP 211/RN FROM THE ELECTRON CAPTURE DECAY OF /SUP 211/FR.
T. Kempisty, A. Korman, T. Morek, L. K. Peker, and Z. Khartym. 1972, 12p
Lang- In Russian. U. S. Sales only

Descriptors: *Radon isotopes rn- .

For abstract, see NSA 27 06, number 13534.

JINR-P6-6725 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Reactions.
SOME REGULARITIES IN THE PROPERTIES OF LOW-LYING LEVELS IN THE EVEN ISOTOPES OF RN. DECAY OF /SUP 210/FR INTO /SUP 210/RN.
T. Kempisty, A. Korman, T. Morek, L. K. Peker, and Z. Khartym. 1972, 16p
Lang- In Russian. U. S. Sales only

Descriptors: *Francium isotopes fr-210, *Radon isotopes rn- .

For abstract, see NSA 27 06, number 13535.

JINR-P6-6794 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Problems.
DETERMINATION OF THE ENERGY OF /SUP 134/CE YIELDS /SUP 134/LA AND /SUP 160/ER YIELDS /SUP 160/HO.
V. S. Aleksandrov, V. S. Buttsev, Ts. Vylov, K. Ya. Gromov, and V. G. Kalinnikov. 1972, 12p
Lang- In Russian. U. S. Sales only

Descriptors: *Cerium isotopes ce-134, *Erbium isotopes er-160.

For abstract, see NSA 27 06, number 13490.

JINR-P6-6804 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Problems.
STUDY OF THE RADIOACTIVE DECAY OF /SUP 137/ND (38.5 MIN). ISOMERISM IN NUCLEUS /SUP 137/ND.
V. S. Buttsev, Ts. Vylov, K. Ya. Gromov, V. G. Kalinnikov, and I. I. Gromova. 1972, 28p
Lang- In Russian. U. S. Sales only

Descriptors: *Neodymium isotopes nd-137, *Praseodymium isotopes pr- 7.

For abstract, see NSA 27 06, number 13491.

KFK-1662 PC$3.00/MF$0.95
Kernforschungszentrum, Karlsruhe (West Germany). Zyklotron-Laboratorium.
ELASTIC AND INELASTIC SCATTERING OF 104 MEV ALPHA PARTICLES ON /SUP 58/ /SUP 60/ /SUP 62/ /SUP 64/NI.
H. Rebel, R. Loehken, G. W. Schweimer, G. Schatz, and G. Hauser. Aug 72, 62p
Lang- In German. U. S. Sales only

Descriptors: *Alpha particles, *Nickel isotopes ni-58, *Nickel isotopes ni-60, *Nickel isotopes ni-62, *Nickel isotopes ni-64.

For abstract, see NSA 27 06, number 13470.

LA-DC-72-1115 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
TRITIUM-PRODUCTION MEASUREMENT WITH APPLICATION TO FUSION REACTOR BLANKET DESIGN.
D. W. Muir, and M. E. Wyman. 4p CONF-720942-1
From Seminar On Nuclear Data And Neutronics Of Ctr Blankets- Seattle, Wa. (19 Sep 1972).

Descriptors: *Lithium, *Lithium isotopes li-7, *Neutrons/ fast.

For abstract, see NSA 27 06, number 13412.

LBL-1020 PC$3.00/MF$0.95
California Univ., Berkeley. Lawrence Berkeley Lab.
STRUCTURE IN THE 2PI/SUP 0/ MASS SPECTRUM IN THE REACTION PI/SUP -/P YIELDS NPI/SUP 0/PI/SUP 0/ AT 1.6 TO 2.4 GEV/C.
A. Skuja, M. A. Wahlig, T. B. Risser, M. Pripstein, and J. E. Nelson. Jul 72, 28p CONF-720954-4
Contract W-7405-ENG-48
From 16. International Conference On High Energy Physics- Batavia, Il (6 Sep 1972).

Descriptors: *Mesons K, *Mesons/ resonance, *Protons.

For abstract, see NSA 27 06, number 13087.

LBL-1314 PC$3.00/MF$0.95
California Univ., Berkeley. Lawrence Berkeley Lab.
Y* SEARCH.
T. A. Lasinski. Oct 72, 22p CONF-720954-2
Contract W-7405-ENG-48
From 16. International Conference On High Energy Physics- Batavia, Il (6 Sep 1972).

Descriptors: *Baryons/ resonance N, *Baryons/ resonance Z.

For abstract, see NSA 27 06, number 13227.

LUSY-7208 PC$3.00/MF$0.95
Lund Univ. (Sweden). Dept. Of Physics.
SMALL ANGLE SCATTERING OF HIGH ENERGY PHOTONS ON HEAVY NUCLEI (DELBRUECK SCATTERING, PHOTON SPLITTING).
G. Jarlskog, L. Joensson, S. Pruenster, H. D. Schulz, and H. J. Willutzki. 1972, 35p
U. S. Sales only

Descriptors: *Nuclei/ heavy, *Photons.

For abstract, see NSA 27 06, number 13594.

LYCEN-7248 PC$3.00/MF$0.95
Lyon Univ. (France). Institut De Physique Nucleaire.
DECAYS OF 5.5 MIN /SUP 168G/LU AND 6.7 MIN /SUP 168M/LU.
A. Charvet, R. Chery, Do Huu Phuoc, R. Duffait, and A. Emsallem. Jul 72, 17p
U. S. Sales only

Descriptors: *Lutetium isotopes lu-168, *Ytterbium isotopes yb- 68.

For abstract, see NSA 27 06, number 13518.

NP-19602 PC$3.00/MF$0.95
Instituut Voor Kernphysisch Onderzoek, Amsterdam (Netherlands).
PROGRESS REPORT, 1971-1972.
1972, 121p
U. S. Sales only

Descriptors: *Nuclear physics.

For abstract, see NSA 27 06, number 13381.

NP-19622 PC$3.00/MF$0.95
Bonn Univ. (West Germany). Physikalisches Institut.
COHERENT PI/SUP 0/-PHOTOPRODUCTION ON DEUTERIUM IN THE FIRST RESONANCE REGION.
G. Von Holtey, G. Knop, H. Stein, J. Stuempfig, and H. Wahlen. Nov 72, 16p PIB-1-182
U. S. Sales only

Descriptors: *Deuterons, *Mesons, *Photons.

For abstract, see NSA 27 06, number 13018.

N73-16637 PC$5.75/MF$0.95
Research Inst. of National Defence, Stockholm (Sweden).
TRANSURANIC ELEMENTS, PRESENT AND FUTURE.
L. Wallin. Jun 71, 71p FOA-4-C-4463-22 (13)
Language Swedish

Descriptors: *Manufacturing, *Transuranium elements, *Utilization, Nuclear explosions, Nuclear physics, Nuclear reactors, Radioactive isotopes.

For abstract, see STAR 11 07.

N73-16665 PC$3.75/MF$0.95
Oak Ridge National Lab., Tenn.
COMPARISON OF THE RESULTS OF CALCULATIONS DONE AT DIFFERENT LABORATORIES WITH EACH OTHER AND WITH EXPERIMENTS ON THE SECONDARY PROTON AND NEUTRON SPECTRA FROM PROTONS AT 140 AND 160 MEV ON NUCLEI.
H. W. Bertini. 28 Jul 66, 32p NASA-CR-130347
NASA ORDER R-09-019-901

Descriptors: *Monte carlo method, *Neutron spectra, *Proton scattering, *Secondary emission, *Spectrum analysis, Aluminum, Beryllium, Bismuth, Cobalt, Lead (metal), Nuclear scattering, Nuclei (nuclear physics), Proton impact.

For abstract, see STAR 11 07.

N73-16667 PC$3.00/MF$0.95
Tokyo Univ. of Education (Japan). Dept. of Physics.
DIFFRACTIVE PRODUCTIONS AND LEVEL DENSITY OF MESON RESONANCES IN THE RELATIVISTIC EXTENDED QUARK MODEL AND MISSING-MASS SPECTRA OBSERVED IN PION (MINUS) PROTON YIELDS PROTON X (MINUS).
T. Kobayashi, and N. Nakamaru. Sep 72, 14p TUEP-72-41

Descriptors: *Mass spectra, *Meson resonances, *Proton-proton reactions, *Quarks, Diffraction, Pions, Spin resonance, Theoretical physics.

For abstract, see STAR 11 07.

N73-16668 PC$3.00/MF$0.95
Tokyo Univ. of Education (Japan). Dept. of Physics.
REGGE PHENOMENOLOGY IN THE CENTRAL REGION.
S. Sakai. 1972, 11p TUEP-72-46

Descriptors: *Meson-nucleon interactions, *Regge poles, *Theoretical physics, Antiparticles, Kaons, Nuclear reactions, Protons, Scaling, Two body problem.

For abstract, see STAR 11 07.

N73-16669 PC$3.00/MF$0.95
Tokyo Univ. of Education (Japan). Dept. of Physics.
HIGH ENERGY ELECTRON-PROTON INELASTIC SCATTERING AND GENERALIZED VECTOR MESON DOMINANCE MODEL IN THE RELATIVISTIC EXTENDED QUARK MODEL.
T. Kobayashi. Oct 72, 14p TUEP-72-43

Descriptors: *Electron phonon interactions, *Inelastic collisions, *Mesons, *Vector dominance model, High energy interactions, Nuclear models, Quarks, Scattering, Theoretical physics.

For abstract, see STAR 11 07.

N73-16674 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
THE REACTION PROTON DEUTERON YIELDS TRITON PION AT 470 AND 590 MEV.
W. Dollhopf, C. Lunke, C. F. Perdrisat, W. K. Roberts, and P. Kitching. 1973, 17p
NASA-TM-X-68187, E-7325
Subm- Sponsored in Part By Research Corp.

Descriptors: *Deuterons, *Nuclear reactions, *Nuclei (nuclear physics), *Pions, *Proton energy, *Tritons, Momentum transfer, Nucleon-nucleon interactions, Particle telescopes, Spark chambers.

For abstract, see STAR 11 07.

ORNL-TM-4015 PC$3.00/MF$0.95
Oak Ridge National Lab., Tenn.
ALC1 PROGRAM FOR CROSS-SECTION LIBRARY MANAGEMENT.
W. A. Rhoades. Dec 72, 15p
Contract W-7405-ENG-26

Descriptors: *Computer programs, *Neutron cross sections.

For abstract, see NSA 27 06, number 13384.

ORO-3491-20 PC$3.00/MF$0.95
Maryland Univ., College Park. Dept. Of Physics And Astronomy.
1972 PROGRESS REPORT FOR THE EXPERIMENTAL STUDY OF THE STRUCTURE OF NUCLEI AND THE INTERACTIONS OF INTERMEDIATE ENERGY PARTICLES.
Oct 72, 117p
Contract AT (40-1)-3491

Descriptors: *Alpha particles, *Beryllium isotopes be-9, *Calcium isotopes ca-40, *Carbon isotopes c-12, *Deuterium, *Deuterons, *Fluorine isotopes f-19, *Helium isotopes he-3, *Helium isotopes he-4, *Instruments, *Nickel isotopes ni-58, *Protons, *Uranium isotopes u- 6, *Uranium isotopes u- 8, *Zirconium isotopes zr-9 .

For abstract, see NSA 27 06, number 13395.

ORO-4317-10 PC$3.00/MF$0.95
Maryland Univ., College Park. Dept. Of Physics And Astronomy.
EVIDENCE FOR A STRONG THREE-BODY FORCE IN THE TRITON. TECHNICAL REPORT NO. 73-048.
D. D. Brayshaw. Oct 72, 20p CONF-720819-18
From International Conference On Few Particle Problems In Nuclear Interactions- Los Angeles, Ca (28 Aug 1972).

Descriptors: *Tritons.

For abstract, see NSA 27 06, number 13595.

RI-72-8 PC$3.00/MF$0.95
Paris Univ., Orsay (France). Laboratoire De L'Accelerateur Lineaire.
OUTLINE OF THE EXPERIMENT GAMMAD YIELDS PI/SUP -/PP ON CALCULATOR VARIAN 620/I.
J. Boucrot, and W. Mcgill. Oct 72, 26p
Lang- In French. U. S. Sales only

Descriptors: *Deuterons, *Mesons K, *Photons.

For abstract, see NSA 27 06, number 13019.

RLO-2041-74 PC$3.00/MF$0.95
Oregon Univ., Eugene. Inst. Of Theoretical Science. Stanford Linear Accelerator Center, Calif.
FRAGMENTATION IN THE CENTRAL REGION- POSSIBILITY OF A DISCONTINUITY AT X ± 0.
R. C. Hwa, and P. A. Zucker. Jul 72, 15p
CONF-720954-1, SLAC-PUB-1073
From 16. International Conference On High Energy Physics- Batavia, Il (6 Sep 1972).

Descriptors: *Elementary particles, *Hadrons, *Mesons, *Protons.

For abstract, see NSA 27 06, number 13187.

RLO-2041-81 PC$3.00/MF$0.95
Oregon Univ., Eugene.
DIFFRACTIVE EXCITATION MODEL.
R. C. Hwa. 1972, 13p CONF-720419-6
Contract AT (45-1)-2041
From 4. International Conference On High Energy Collisions- Oxford, England (5 Apr 1972).

Descriptors: *Elementary particle models, *Elementary particles.

For abstract, see NSA 27 06, number 13188.

TID-26236 PC$3.00/MF$0.95
Florida State Univ., Tallahassee. Coll. Of Arts And Sciences.
PARTIAL-WAVE ANALYSIS OF THE REACTION K/SUP -/N YIELDS SIGMA/SUP +/PI/SUP -/PI/SUP -/ FROM 1.62 TO 1.74 GEV.
C. D. Capps. Aug 72, 42p
Contract AT (40-1)-3509
Thesis.

Descriptors: *Mesons KK, *Neutrons.

For abstract, see NSA 27 06, number 13228.

TID-26239 PC$3.00/MF$0.95
Florida State Univ., Tallahassee. High Energy Physics.
DATA PROCESSING AND PRELIMINARY RESULTS OF PI/SUP +/D AT 15 GEV/C.
B. B. Wind. Aug 72, 60p
Contract AT (40-1)-3509

Descriptors: *Baryons/ resonance, *Deuterons, *Mesons J, *Mesons RHO, *Mesons/ resonance.

For abstract, see NSA 27 06, number 13088.

UCLA-10-P-25-6 REV PC$3.00/MF$0.95
California Univ., Los Angeles.
MEASUREMENT OF THE DIFFERENTIAL CROSS SECTION FOR PI/SUP -/P YIELDS PI/SUP 0/N BETWEEN 502 AND 888 MEV/C.
D. J. Blasberg, J. C. Comiso, and K. M. Crowe.
25p CONF-720954-9
From 16. International Conference On High Energy Physics- Batavia, Il (6 Sep 1972).

Descriptors: *Mesons K, *Protons.

For abstract, see NSA 27 06, number 13089.

UCLA-10-P-25-7 (REV.) PC$3.00/MF$0.95
California Univ., Los Angeles.
MEASUREMENT OF DIFFERENTIAL CROSS SECTIONS FOR RADIATIVE PION-PROTON CAPTURE IN THE SECOND RESONANCE REGION.
A. J. Weiss, D. J. Blasberg, and K. M. Crowe. Sep 72, 29p CONF-720954-6
Contract AT (11-1)-GEN-10
From 16. International Conference On High Energy Physics- Batavia, Il (6 Sep 1972).

Descriptors: *Baryons/ resonance N, *Invariance principles, *Mesons K, *Protons.

For abstract, see NSA 27 06, number 13020.

UCLA-10-X-1 PC$3.00/MF$0.95
California Univ., Los Angeles.
PARTICLE PHYSICS. TECHNICAL PROGRESS REPORT.
R. P. Haddock. 1972, 12p
Contract AT (11-1)-GEN-10

Descriptors: *Elementary particles, *Hadrons.

For abstract, see NSA 27 06, number 13090.

UCR-34-P-10-7-B-140 PC$3.00/MF$0.95
California Univ., Riverside.
ANNUAL REPORT.
A. Kernan, and R. T. Poe. May 72, 25p
Contract AT (04-3)-34

Descriptors: *Elementary particles, *Hadrons.

For abstract, see NSA 27 06, number 13091.

UCRL-TRANS-10655 PC$3.00/MF$0.95
PRECISION MEASUREMENT OF THE /SUP 27/AL (N,ALPHA) CROSS-SECTION FOR 14.43 MEV NEUTRONS.
H. Vonach, M. Hille, G. Stengl, W. Breunlich, and E. Werner. 36p

Descriptors: *Aluminum isotopes al-27, *Neutrons/ fast.

For abstract, see NSA 27 06, number 13451.

UH-511-124-72 PC$3.00/MF$0.95
Hawaii Univ., Honolulu. Dept. Of Physics And Astronomy.
HEURISTIC MODEL FOR MULTI-PARTICLE PRODUCTION IN PI/SUP -/P INTERACTIONS.
A. D. Johnson. 1972, 162p
Contract AT (04-3)-511
Thesis.

Descriptors: *Baryons/ resonance M, *Mesons, *Mesons K, *Mesons RHO, *Protons.

For abstract, see NSA 27 06, number 13092.

WAPD-TM-1052 PC$3.00/MF$0.95
Bettis Atomic Power Lab., Pittsburgh, Pa.
REVISION OF THE THERMAL PARAMETERS OF /SUP 233/U.
N. M. Steen. Sep 72, 61p
Contract AT-11-1-GEN-14

Descriptors: *Neutrons/ thermal, *Uranium isotopes u-.

For abstract, see NSA 27 06, number 13552.

20I. Plasma Physics

AD-757 043 PC$3.00/MF$0.95
Maryland Univ College Park Dept of Physics and Astronomy
PRODUCTION OF THERMONUCLEAR PLASMAS BY ANOMALOUS DIFFUSION OF MAGNETIC FIELDS IN A HIGH VOLTAGE THETA PINCH.
Annual summary rept.
Nov 72, 52p
Contract N00014-67-A-0239-0015

Descriptors: (*Plasma medium, *Magnetic pinch), Heating, Stability, Turbulence, Electron density, Ion beams, Lasers, Light transmission, Curve fitting, Graphics.
Identifiers: *Nuclear fusion, Plasma heating, Plasma instabilities, Laser beams.

The report summarizes work done at the University of Maryland on the problem of plasma heating by application of a large amplitude magnetic pulse to the plasma boundary. Particular interest is given to understanding the ion heating that results from growth of drift instabilities. In the period covered by the report the experimental work has concentrated on parametric studies of ion heating for various initial conditions, and on measurements of density fluctuations by light scattering. The theory work has been concentrated in finding realistic models for resistive and viscous loss to be used in numerical fluid codes. (Author Modified Abstract)

AD-757 228 PC$3.00/MF$0.95
Illinois Univ Urbana Dept of Electrical Engineering
AN EXPERIMENTAL STUDY OF THE FEASIBILITY OF INERTIALLY CONFINING ENERGETIC ELECTRONS AND IONS BY ELECTROSTATIC MEANS.
Final rept. 1 Jul 68-31 Dec 72,
Joseph T. Verdeyen, and Blake E. Cherrington.
Feb 73, 54p* Rept no. UILU-ENG-73-2546
AFOSR-TR-73-0438
Grant AF-AFOSR-1584-68

Descriptors: (*Plasma medium, Containment), (*Electrostatic fields, Plasma medium), Deuterium, Gases, Electron beams, Ion beams, Langmuir probes, Space charges, Parabolic bodies, Electron density, Microwaves, Graphics, Theory, Feasibility studies.
Identifiers: Nuclear fusion, Plasma diagnostics.

Experimental studies of the potential and the electron density inside inertial electrostatic plasma confinement devices have been performed using electron beam, microwave and laser diagnostic techniques. A distinctly oscillatory variation of the electron density as a function of radius was found in the cylindrical device for electron and ion injection into a low pressure deuterium gas background. Electron injection into a hard vacuum was found to produce a deep potential well in the spherical device whereas electron injection into a low pressure gas was found to create steady state alternating potential wells. (Author)

AD-757 247 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
AN INVESTIGATION OF THE SELF-GENERATED MAGNETIC FIELDS ASSOCIATED WITH A LASER-PRODUCED PLASMA.
Doctoral thesis,
Leslie Lawrence McKee, III. Dec 72, 175p

Descriptors: (*Plasma medium, Magnetic fields), (*Magnetic fields, Production), Electron density, Ions, Interactions, Probes, Partial differential equations, Curve fitting, Graphics, Programming (Computers), Reynolds number, Theses.
Identifiers: *Laser produced plasmas, Laser beams, Ion density (Concentration), Maxwells equations.

A plasma was produced by irradiating a 5 mil thick Mylar ($C_{10}H_8O_4$) foil with a 300 MW, 25 nsec Nd laser pulse. Magnetic fields were observed to spontaneously arise when the laser-produced plasma was formed. The dependence of the self-generated magnetic fields on position, time, incident laser power, and ambient background pressure was investigated. The strength of the magnetic field, as well as its spatial and temporal dependences, was found to depend quite strongly on the background pressure of nitrogen. Most significantly, the strength of the field increased by a factor of six when the pressure of the nitrogen background was increased from 1 mTorr to 200 mTorr. The results are analyzed by use of a theory in which the presence of a background gas influences the generating mechanism of the fields. (Author)

AD-757 265 PC$3.00/MF$0.95
Air Force Weapons Lab Kirtland AFB N Mex
COMPUTER SIMULATION OF THE SATURATION OF THE PARAMETRIC INSTABILITY IN THE WEAK TURBULENCE REGION.
Technical rept. Jan-Oct 72,
Brendan B. Godfrey, Clifford E. Rhoades, Jr., and Keith A. Taggart. Feb 73, 39p Rept no. AFWL-TR-72-228

Descriptors: (*Plasma oscillations, Stability), Kinetic theory, Dispersion relations, Langmuir probes, Electron density, Ions, Curve fitting, Graphics, Mathematical models.
Identifiers: Computerized simulation, Plasma instabilities, Ion acoustic waves, Electron energy.

The theory of nonlinear saturation of the parametric decay instability in the weak turbulence limit is developed, and the resulting kinetic equation solved numerically for a variety of cases. These solutions are compared with the results of a series of computer simulations. Agreement is found to be good only for pump powers below threshold, with the reason for partial failure above threshold unclear. The validity of the random phase approximation is discussed also. A summary of computational methods is provided. (Author)

AD-757 514 PC$6.00/MF$0.95
Innsbruck Univ (Austria) Inst for Theoretical Physics
LITERATURE SURVEY ON PLASMA INSTABILITIES COVERING 1971 PUBLICATIONS. PART 2. ABSTRACTS 218-435.
Scientific rept.,
G. Auer, F. Cap, and P. Shukla. 31 Dec 72, 309p*
Rept no. UNICP-SR95 AFOSR-TR-73-0490
Contract F44620-72-C-0016
See also Part 1, AD-757 857.

Descriptors: (*Plasma physics, Reviews), Plasma oscillations, Magnetohydrodynamics, Electron density, Stability, Electron beams, Ion beams, Shock waves, Interactions, Dispersion relations, Differential equations, Abstracts, Austria.
Identifiers: *Plasma instabilities, Microinstabilities, Plasma diagnostics, Plasma dynamics.

The report is the second part of the literature survey on plasma instabilities covering the year 1971. The volume contains 218 abstracts and the list of journals. (Author)

AD-757 637 PC$3.00/MF$0.95
Polytechnic Inst of Brooklyn N Y
RESEARCH OF AEROPHYSICS INSTITUTE FOR STRATEGIC TECHNOLOGY.
Semi-annual technical summary for period ending 31 Aug 72,

Martin H. Bloom. Mar 72, 24p Rept no. PIBAL-72-B AROD-8677:33-P
Contract DAHC04-69-C-0077, ARPA Order-1442
See also AD-749 287.

Descriptors: (*Plasma physics, Scientific research), (*Fluid mechanics, Scientific research), Abstracts, Upper atmosphere, Exhaust flames, Atmosphere entry, Turbulence, Shock waves, Lasers, Probes, Electron beams.
Identifiers: Remote sensing.

The report contains a description of the technical problem areas and accomplishments achieved during the reporting period. In addition, a complete list of publications, presentations, lectures, etc. is included and the personnel associated with the program are listed. The research projects are in the general subject areas of fluid and plasma dynamics. (Author Modified Abstract)

AWRE-O-56/72 PC$3.00/MF$0.95
Atomic Weapons Research Establishment, Aldermaston (England).
TIME OF FLIGHT/ENERGY ANALYSIS OF ARC PLASMA.
H. P. S. Powell, and W. D. Owen. Oct 72, 20p
U. S. Sales only

Descriptors: *Electrostatic analyzers, *Plasma diagnostics.

For abstract, see NSA 27 06, number 13672.

CEA-CONF-1895 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Fontenay-Aux-Roses (France). Centre D'Etudes Nucleaires.
THEORETICAL AND EXPERIMENTAL STUDY OF THE HF CURRENT ASSOCIATED WITH A PLASMA WAVE.
F. Gervais, M. Guillemot, J. Olivain, and A. Quemeneur. 1971, 3p CONF-720957-1
From Conference On Gas Discharges- London, England (11 Sep 1972). U. S. Sales only

Descriptors: *Plasma wave phenomena.

For abstract, see NSA 27 06, number 13775.

CEA-R-4375 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Limeil-Brevannes (France). Centre D'Etudes.
STOCHASTIC KINETIC THEORY OF THE INTERACTION OF AN ELECTRON PLASMA WITH AN INTENSE ELECTROMAGNETIC WAVE.
G. Di Bona, and C. Masselot. Dec 72, 83p
Lang- In French. U. S. Sales only

Descriptors: *Electromagnetic waves, *Plasma wave phenomena.

For abstract, see NSA 27 06, number 13776.

CEA-R-4379 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Limeil-Brevannes (France). Centre D'Etudes.
EXPERIMENTAL ASPECTS OF RADIATION--PLASMA INTERACTIONS.
Georges Piar. Dec 72, 61p
Lang- In French. U. S. Sales only

Descriptors: *Laser radiation, *Plasma production, *Thermonuclear reactions.

For abstract, see NSA 27 06, number 13723.

COM-73-50233 Not available NTIS
National Bureau of Standards, Washington, D.C.
THE FORMATION OF SPECTRAL LINES.
Final rept.,
D. G. Hummer, and G. B. Rybicki. 1971, 34p
Pub. in Annual Review of Astronomy and Astrophysics, v9 p237-270 1971.

Descriptors: (*Plasmas (Physics), *Atomic spectra).

An introductory survey is given of the current theory of spectral line formation in optically thick systems. (Author)

GULF-GA-A-12374 PC$3.00/MF$0.95
Gulf General Atomic Co., San Diego, Calif.
IMPURITY RADIATION LOSS ESTIMATION FROM FUSION REACTOR PLASMAS.
G. R. Hopkins. 30 Oct 72, 12p CONF-721111-19
Contract AT (04-3)-167
From International Meeting On The Technology Of Controlled Thermonuclear Fusion Experiments And The Engineering Aspects Of Fusion Reactors- Austin, Tx (20 Nov 1972).

Descriptors: *Plasma.

For abstract, see NSA 27 06, number 13689.

INR-P-1414 PC$3.00/MF$0.95
Institute Of Nuclear Research, Warsaw (Poland).
MEASUREMENTS OF ENERGY DISTRIBUTION OF PLASMA IONS WITH AN ELECTROSTATIC ANALYZER.
M. Sadowski, E. Skladnik-Sadowska, and K. Sudlitz. 1972, 34p
U. S. Sales only

Descriptors: *Electrostatic analyzers, *Plasma diagnostics.

For abstract, see NSA 27 06, number 13673.

JINR-E4-6716 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Computing Techniques And Automation.
ANOMALOUS HEATING OF DENSE PLASMA BY LASER RADIATION.
V. G. Makhankov, and V. N. Tsytovich. 1972, 31p CONF-720961-6
From Symposium On Plasma Heating And Injection- Varenna, Italy (21 Sep 1972). U. S. Sales only

Descriptors: *Laser radiation, *Plasma.

For abstract, see NSA 27 06, number 13659.

LA-DC-72-1389 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
SCYLLAC MHD FEEDBACK SYSTEM.
R. F. Gribble. 1972, 15p CONF-721111-9
From International Meeting On The Technology Of Controlled Thermonuclear Fusion Experiments And The Engineering Aspects Of Fusion Reactors- Austin, Tx (20 Nov 1972).

Descriptors: *Pinch devices.

For abstract, see NSA 27 06, number 13747.

LBL-1018 PC$3.00/MF$0.95
California Univ., Berkeley. Lawrence Berkeley Lab.
PROGRESS IN THE DEVELOPMENT OF HIGH--INTENSITY NEUTRAL BEAMS.
W. B. Kunkel. 1 Sep 72, 25p CONF-720961-1
Contract W-7405-ENG-48
From Symposium On Plasma Heating And Injection, Varenna, Italy (21 Sep 1972).

Descriptors: *Plasma accelerators.

For abstract, see NSA 27 06, number 13690.

LFEN-143-B PC$3.00/MF$0.95
Junta De Energia Nuclear, Sacavem (Portugal). Laboratorio De Fisica E Engenharia Nucleares.
OPERATING CHARACTERISTICS OF A PLASMA CURRENT MULTIPLIER.
P. C. Stangeby, and R. N. Rosa. 1972, 11p
U. S. Sales only

Descriptors: *Electronic equipment.

For abstract, see NSA 27 06, number 14408.

MATT-928 PC$3.00/MF$0.95
Princeton Univ., N. J. Plasma Phyics Lab.
HEATING A TOKAMAK PLASMA.
T. H. Stix. Oct 72, 22p CONF-720961-4
Contract AT (11-1)-3073
From Symposium On Plasma Heating And Injection- Varenna, Italy (21 Sep 1972).

Descriptors: *Plasma, *Tokamak devices.

For abstract, see NSA 27 06, number 13660.

MATT-929 PC$3.00/MF$0.95
Princeton Univ., N. J. Plasma Physics Lab.
PHYSICS OF RF HEATING.
T. H. Stix. Oct 72, 19p CONF-720961-5
Contract AT (11-1)-3073
From Symposium On Plasma Heating And Injection- Varenna, Italy (21 Sep 1972).

Descriptors: *Plasma.

For abstract, see NSA 27 06, number 13661.

MATT-938 PC$3.00/MF$0.95
Princeton Univ., N. J. Plasma Physics Lab.
SURVEY OF EXPERIMENTS ON PARAMETRIC INSTABILITIES AND ANOMALOUS ABSORPTION.
Miklos Porkolab. Nov 72, 19p CONF-720961-2
Contract AT (11-1)-3073
From Symposium On Plasma Heating And Injection- Varenna, Italy (21 Sep 1972).

Descriptors: *Plasma, *Plasma instabilities.

For abstract, see NSA 27 06, number 13662.

MATT-939 PC$3.00/MF$0.95
Princeton Univ., N. J. Plasma Physics Lab.
LINEAR THEORY OF PARAMETRIC INSTABILITIES IN PLASMA.
Miklos Porkolab. Nov 72, 33p CONF-720961-3
Contract AT (11-1)-3073
From Symposium On Plasma Heating And Injection- Varenna, Italy (24 Sep 1972).

Descriptors: *Plasma instabilities.

For abstract, see NSA 27 06, number 13729.

MATT-943 PC$3.00/MF$0.95
Princeton Univ., N. J. Plasma Physics Lab.
ANOMALOUS ABSORPTION OF RADIATION BY PLASMAS.
J. M. Dawson. Nov 72, 36p
Contract AT (11-1)-3073

Descriptors: *Laser radiation, *Plasma.

For abstract, see NSA 27 06, number 13709.

N73-16273 PC$4.00/MF$0.95
Royal Inst. of Tech., Stockholm (Sweden). Dept. of Plasma Physics.
THE ASSERTION THAT ALL RECTANGLES ARE SQUARE OR A CRITICAL REVIEW OF SOME METHODS OF PROOF GENERALLY ACCEPTED IN THE KINETIC THEORY OF GASES AND PLASMAS.
E. Dahlberg. Nov 72, 38p TRITA-EPP-72-25

Descriptors: *Boltzmann transport equation, *Gas dynamics, *Kinetic theory, *Particle collisions, Binary fluids, Liouville equations, Plasma dynamics, Textbooks, Velocity.

For abstract, see STAR 11 07.

N73-16686 PC$10.75/MF$0.95
Stanford Univ., Calif. Inst. for Plasma Research
NONLINEAR WAVE INTERACTION IN A PLASMA COLUMN.
J. Larsen. Oct 72, 174p NASA-CR-130350, SU-IPR-493
Contracts NGL-05-020-176, N00014-67-A-0112-0044

Descriptors: *Plasma control, *Wave interaction, Dielectrics, Electromagnetic fields, Electron plasma, Geomagnetism, Ion motion, Nonlinearity, Plasma frequencies, Radiation distribution.

For abstract, see STAR 11 07.

N73-16689 PC$3.00/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
DIFFUSION COEFFICIENT OF A PLASMA IN CROSSED ELECTRIC AND MAGNETIC FIELDS.
I. L. Popov. Jan 73, 7p NASA-TT-F-14523
Contract NASW-2483
Tran- Transl. Into English From Dopovidi Akad. Nauk Ukr. Ssr (Kiev), V. 34, Mar. 1972 P 221-223

Descriptors: *Diffusion coefficient, *Ion motion, Electric fields, Magnetic fields, Plasma physics.

For abstract, see STAR 11 07.

N73-16690 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ENERGY DISTRIBUTION FUNCTIONS OF KILOVOLT IONS PARALLEL AND PERPENDICULAR TO THE MAGNETIC FIELD OF A MODIFIED PENNING DISCHARGE.
R. J. Roth. Feb 73, 17p NASA-TN-D-7167, E-7181

Descriptors: *Ion charge, *Ion distribution, *Ion emission, *Penning discharge, *Plasma generators, Distribution functions, Ion motion, Kinetic energy, Plasma heating.

For abstract, see STAR 11 07.

N73-16693 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
A THEORETICAL AND EXPERIMENTAL INVESTIGATION OF THE LINEAR AND NONLINEAR IMPULSE RESPONSES FROM A MAGNETOPLASMA COLUMN.
N. C. Grody. Feb 73, 72p NASA-TR-R-400, G-1072

Descriptors: *Argon plasma, *Electric fields, *Plasma oscillations, *Plasma-electromagnetic interaction, Excitation, Plasma diagnostics, Plasma resonance, Plasmas (physics).

For abstract, see STAR 11 07.

N73-16714 PC$7.50/MF$0.95
Royal Inst. of Tech., Stockholm (Sweden). Div. of Plasma Physics and Fusion Research.
IMPERMEABLE PLASMAS CONFINED IN POLOIDAL MAGNETIC FIELDS.
B. Lehnert. Sep 72, 107p TRITA-EPP-72-21

Descriptors: *Magnetohydrodynamic stability, *Nuclear reactors, *Plasma control, Bottles, Electric conductors, Generators, Magnetic fields, Nuclear fusion, Permeability, Rotating plasmas.

For abstract, see STAR 11 07.

N73-16715 PC$4.50/MF$0.95
Royal Inst. of Tech., Stockholm (Sweden). Dept. of Plasma Physics.
MODELS OF FORCE-FREE MAGNETIC FIELDS IN RESISTIVE MEDIA.
R. Bostroem. Nov 72, 50p TRITA-EPP-72-24

Descriptors: *Force-free magnetic fields, *Mathematical models, *Plasma conductivity, *Plasmas (physics), Electric current, Electric fields, Velocity.

For abstract, see STAR 11 07.

N73-16716 PC$4.00/MF$0.95
Royal Inst. of Tech., Stockholm (Sweden). Dept. of Plasma Physics and Fusion Research.
ON THE SCALING LAWS OF PERMEABLE AND IMPERMEABLE TOKAMAK PLASMAS.
B. Lehnert. 19 Nov 72, 39p TRITA-EPP-72-26

Descriptors: *Permeability, *Plasma interactions, *Scaling laws, Magnetohydrodynamic stability, Plasma density, Plasma diagnostics, Plasma layers.

For abstract, see STAR 11 07.

N73-16717 PC$3.50/MF$0.95
Royal Inst. of Tech., Stockholm (Sweden). Dept. of Electron Physics.
SHOCK HEATING OF PLASMA BY MEANS OF SUPERPOSED FIELDS AND MAGNETIC ENERGY STORAGE. SOME NEW IDEAS.
E. Halmoey. Dec 72, 29p TRITA-EPP-72-29

Descriptors: *Energy storage, *Magnetic storage, *Plasma heating, *Shock heating, *Superconductors, Electric current, Magnetic fields, Plasma control, Plasma decay, Plasma diagnostics, Superposition (mathematics), Theta pinch.

For abstract, see STAR 11 07.

SC-RR-720827 PC$3.00/MF$0.95
Sandia Labs., Albuquerque, N. Mex.
CONTINUUM ELECTROSTATIC PROBES IN THE PRESENCE OF NEGATIVE IONS. NUMERICAL COMPUTATION.
P. B. Bailey, and K. J. Touryan. Dec 72, 24p

Descriptors: *Electric probes.

For abstract, see NSA 27 06, number 14431.

TRITA-EPP-72-20 PC$3.00/MF$0.95
Kungliga Tekniska Hogskolan, Stockholm (Sweden).
AN ION FLUX PROBE FOR A LOW PRESSURE DISCHARGE PLASMA.
S. Torven, and M. Babic. Sep 72, 11p
U. S. Sales only

Descriptors: *Electric probes, *Plasma diagnostics.

For abstract, see NSA 27 06, number 13674.

TRITA-EPP-72-21 PC$3.00/MF$0.95
Kungliga Tekniska Hogskolan, Stockholm (Sweden).
IMPERMEABLE PLASMAS CONFINED IN POLOIDAL MAGNETIC FIELDS.
B. Lehnert. Sep 72, 106p
U. S. Sales only

Descriptors: *Plasma, *Plasma instabilities.

For abstract, see NSA 27 06, number 13663.

20J. Quantum Theory

AAEC/TM-684 PC$3.00/MF$0.95
Australian Atomic Energy Commission Research Establishment, Lucas Heights.
MEATPI AND SORCE- TWO PROGRAMS TO CALCULATE SCATTERING POTENTIALS FROM PHASE SHIFTS.
E. Clayton. Aug 72, 15p
U. S. Sales only

Descriptors: *Computer programs, *Scattering.

For abstract, see NSA 27 06, number 13311.

AD-757 312 Reprint
Army Electronics Command Fort Monmouth N J Inst for Exploratory Research
MASS SHIFT OF A CHARGED SCALAR PARTICLE IN AN INTENSE STANDING ELECTROMAGNETIC WAVE,
Harry L. Berkowitz, and Bernard Rosen. 19 Jul 71, 5p
Availability: Pub. in Physical Review D, v5 n6 p1308-1312, 15 Mar 72.

Descriptors: (*Mass-Energy relation, Charged particles), (*Charged particles, Electromagnetic waves), Wave functions, Differential equations, Perturbation theory.
Identifiers: Klein-Gordon equation, Plane waves, Laser beams.

A method for the approximate solution to the Klein-Gordon equation for a charged particle in the presence of two electromagnetic, noncollinear, transverse plane waves has been developed. The solution is a product of functions which are either solutions to linear, ordinary, differential equations of the Hill type or solutions to a Volkov equation. The mass-energy relation for the scalar particle in this approximation has a complicated dependence on the field strengths and on the particle momentum. In particular, the authors find that a slowly moving particle in an intense standing electromagnetic wave has a mass shift of order v squared/c squared times that given by second-order perturbation theory. Here v is the component of particle velocity perpendicular to the direction of 'propagation' of the waves. (Author)

CNRS-CPT-72-P-470 PC$3.00/MF$0.95
Centre National De La Recherche Scientifique, Marseilles (France). Centre De Physique Theorique.
SPONTANEOUSLY BROKEN GAUGE INVARIANCE- WARD IDENTITIES, SLAVNOV IDENTITIES, GAUGE INVARIANCE.
L. Quaranta, A. Rouet, R. Stora, and E. Tirapegui. Jul 72, 20p CONF-720663-1
From Meeting On The Renormalization Of Yang-mills Fields And Applications To Particle Physics-Marseilles, France (19 Jun 1972). U. S. Sales only

Descriptors: *Quantum field theory.

For abstract, see NSA 27 06, number 13289.

JINR-E4-6688 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
SYSTEMATICAL AND PRACTICAL TREATMENT OF THE FEW-BODY PROBLEM.
E. O. Alt, P. Grassberger, and W. Sandhas. 1972, 20p
U. S. Sales only

Descriptors: *Scattering.

For abstract, see NSA 27 06, number 13312.

JINR-P2-6801 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
CORRECTIONS TO THE LAMB SHIFT IN NONLOCAL THEORY OF WEAK INTERACTION.
V. G. Malyshkin, Kh. Namsrai, and A. Yu. Yumatov. 1972, 28p
Lang- In Russian. U. S. Sales only

Descriptors: *Atoms, *Quantum field theory.

For abstract, see NSA 27 06, number 13290.

JINR-P2-6828 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.

FINITE-DIFFERENCE PHASE EQUATIONS IN RELATIVISTIC THEORY OF QUASIPOTENTIAL SCATTERING.
V. V. Babikov, G. V. Grusha, R. M. Mir-Kasimov, and N. B. Shul'gina. 1972, 36p
Lang- In Russian. U. S. Sales only

Descriptors: *Elementary particles.

For abstract, see NSA 27 06, number 13313.

JINR-P2-6829 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
APPROXIMATE METHODS FOR SOLUTION OF RELATIVISTIC PHASE EQUATIONS.
V. V. Babikov, G. V. Grusha, R. M. Mir-Kasimov, and N. B. Shul'gina. 1972, 25p
Lang- In Russian. U. S. Sales only

Descriptors: *Elementary particles.

For abstract, see NSA 27 06, number 13314.

20K. Solid Mechanics

AD-757 101 PC$3.00/MF$0.95
Texas Engineering Experiment Station College Station
LARGE DEFLECTION ELASTIC-PLASTIC DYNAMIC RESPONSE OF STIFFENED SHELLS OF REVOLUTION,
James A. Stricklin, Walter E. Haisler, Walter A. Von Riesemann, Roger D. Leick, and Kenneth J. Saczalski. Dec 72, 108p Rept no. TEES-RPT-72-25
Contract N00014-68-A-0308-0004, Grant NGL-44-001-044
Prepared in cooperation with Sandia Labs., Albuquerque, N. Mex., Rept. no. SLA-73-0128.

Descriptors: (*Stiffened cylinders, Deflection), Structural shells, Loading (Mechanics), Elasticity, Plasticity, Kinematics, Strain (Mechanics), Hydrostatic pressure.
Identifiers: Computer aided analysis, Finite element analysis, Dynamic response, DYNAPLAS computer program.

The report presents the formulation and check out problems for a computer code DYNAPLAS, which analyzes the large deflection elastic-plastic dynamic response of stiffened shells of revolution. The formulation for special discretization is by the finite element method with finite differences being used for the evaluation of the pseudo forces due to material and geometric nonlinearities. Time integration is by the Houbolt method. The stiffeners may be due to concentrated or distributed eccentric rings and spring supports at arbitrary angles around the circumference of the elements. Check out problems include the comparison of solutions from DYNAPLAS with experimental and other computer solutions for rings, conical and cylindrical shells and a curved panel. (Author Modified Abstract)

AD-757 207 PC$3.00/MF$0.95
Army Missile Command Redstone Arsenal Ala Ground Equipment and Materials Directorate
DISTRIBUTION OF STRESS ACROSS THE THICKNESS NEAR A CRACK TIP IN A PLATE SUBJECTED TO APPROXIMATE CYLINDRICAL BENDING.
Technical rept.,
Bobby Ray Mullinix. 30 Oct 72, 130p Rept no. RL-72-11

Descriptors: (*Panels (Structural), *Fracture (Mechanics)), (*Stresses, Panels (Structural)), Cracks, Bending, Photoelasticity, Numerical analysis, Computer programs, Thickness.
Identifiers: Stress concentration, Plates (Structural members).

The inplane stress distribution across the thickness is determined by two different methods for a plate loaded in bending. It was found from experimental work that the use of a nonlinear function for the inplane stress distribution across the plate thickness does not result in any significant improvement in the accuracy of the theory for the geometry of through cracks in thin and moderately thick plates. The maximum actual transverse normal stress was approximately one-half the plane strain value.

AD-757 393 Not available NTIS
Shock and Vibration Information Center (Defense) Washington D C
THE SHOCK AND VIBRATION DIGEST. VOLUME 5, NUMBER 1, JANUARY 1973.
Jan 73, 86p
See also Volume 4, Number 12 dated Dec 72, AD-753 955.
Availability: Paper copy available from the Shock and Vibration Information Center, Naval Research Laboratory, Code 8404. Washington, D. C. 20390. Annual Subscription $25.00.

Descriptors: (*Shock (Mechanics), Symposia), (*Vibration, Naval research), Reports, Abstracts, Acoustics, Structural properties, Models (Simulations), Mathematical models, Analysis, Design, Seismology, Damping, Elasticity, Vibration isolators, Bearings, Helicopters, Spacecraft, Turbofan engines.

Contents:
- Analysis and design (Analytical methods, Nonlinear analysis, Numerical analysis, Optimization techniques, Stability analysis, Statistical methods, Variational methods, Finite element modeling, Computer programs);
- Environments (Acoustic, Periodic, Seismic, Shock);
- Phenomenology (Composite, Damping, Elastic, Fluid, Inelastic, Soil, Thermoelastic, Viscoelastic);
- Experimentation;
- Components;
- Systems (Acoustic isolation, Active isolation, Aircraft, Building, Construction, Earth, Electrical, Helicopters, Human, Isolation, Mechanical, Metal work and forming, Off-Road vehicles, Pumps, Turbines, Fans, Compressors, Rail, Reciprocating Machine, Road, Rotors, Self-Excited, Ship, Structural, Transmissions, Turbomachinery.

AD-757 394 Not available NTIS
Shock and Vibration Information Center (Defense) Washington D C
THE SHOCK AND VIBRATION DIGEST, VOLUME 5, NUMBER 2, FEBRUARY 1973.
Feb 73, 70p
See also Volume 5, Number 1 dated Jan 73, AD-757 393.
Availability: Paper copy available from the Shock and Vibration Center, Naval Research Laboratory, Code 8404. Washington, D. C. 20390. Annual Subscription: $25.00.

Descriptors: (*Shock (Mechanics), Symposia), (*Vibration, Naval research), Reports, Abstracts, Acoustics, Structural properties, Models (Simulations), Analysis, Design, Seismology, Shock waves, Damping, Elasticity, Vibration isolators, Bearings, Helicopters, Spacecraft, Turbofan engines.

Contents: Analysis and design (Analytical methods, Impedance methods, Nonlinear analysis, Numerical analysis, Stability analysis, Finite element modeling, Computer programs); Environments (Acoustic, Periodic, Random, Seismic, Shock, General weapon); Phenomenology (Composite, Damping, Elastic, Fluid, Inelastic, Soil, Thermoelastic, Viscoelastic); Experimentation; Components; Systems (Acoustic isolation, Aircraft, Building, Construction, Earth, Helicoptors, Human, Mechanical, Metal working and forming, Pumps, Turbines, Fans, Compressors, Rail, Reactors, Road, Rotors, Self-excited, Spacecraft, Structural, Turbomachinery).

AD-757 523 PC$3.00/MF$0.95
Massachusetts Inst of Tech Cambridge Aeroelastic and Structures Research Lab
ASSUMED STRESS HYBRID FINITE-ELEMENT METHOD FOR FRACTURE MECHANICS AND ELASTIC-PLASTIC ANALYSIS,
Chih-Hung Luk. Dec 72, 249p Rept no. ASRL-TR-170-1 AFOSR-TR-73-0493
Contract F44620-72-C-0018

Descriptors: (*Cracks, Stresses), (*Metals, Cracks), Fracture (Mechanics), Crack propagation, Strain (Mechanics), Strain hardening, Plasticity, Elasticity, Mathematical models.
Identifiers: Fracture mechanics, Finite element analysis.

The purpose of the report is to investigate the reasibility of the assumed stess hybrid finite element method on the analysis of linear fracture mechanics and the elastic-plastic analysis. The hybrid stress model is applied for the evaluation of the elastic stress intensity factors at the tip of a sharp crack. Example solutions include plane stress cracks of both the opening type and the in-plane shear type for isotropic materials and of the opening type for anisotropic materials. Convergence of the numerical solution and the optimum arrangement of the finite element meshes have also been studied. The hybrid stress model is applied to the determination of the static response for structures with elastic-plastic material behaviors. (Author Modified Abstract)

AD-757 550 PC$3.00/MF$0.95
Air Force Academy Colo
ANALYSIS OF PART-THROUGH QUARTER--CIRCULAR CRACKS EMANATING FROM THE BOUNDARY OF AN INTERNAL CIRCULAR HOLE IN A PLATE.
Research rept.,
Terry D. Hinnerichs, and Lanny J. Larson. Dec 72, 44p Rept no. USAFA-RR-72-9

Descriptors: (*Panels (Structural), *Stresses), Numerical analysis, Defects (Materials), Sheets, Orifices, Fracture (Mechanics), Airplane panels.
Identifiers: *Plates (Structural members).

The report develops an approximate equation for determining stress intensities for partially embedded quarter-circular flaws emanating from a circular hole in a sheet material. The development involved the use of the stress concentration factor for a hole in a plate to take into account the effects that the hole has on the cracktip stress intensity. A design criteria less conservative than the through-crack method is proposed for handling a partially embedded crack emanating from a circular hole. (Author Modified Abstract)

AD-757 593 Not available NTIS
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Porz-Wahn (West Germany)
COMPARISON OF SCATTER UNDER PROGRAM AND RANDOM LOADING AND INFLUENCING FACTORS,
G. H. Jacoby, and H. Nowack. 1972, 15p Rept no. DFVLR-Sonderdruck-259
Availability: Pub. in Probabilistic Aspects of Fatigue, ASTM STP 511, American Society for Testing and Materials, p61-74 1972.

Descriptors: (*Fatigue (Mechanics), Probability), Loading (Mechanics), Crack propagation, Scattering, Life expectancy, Statistical analysis, West Germany.
Identifiers: Fatigue tests, Probability distribution functions.

The paper deals with the scatter under program and random loading. For the explanation of the results, constant amplitude tests and tests with biharmonic loading are also included in the study. The basis of the comparison of the data is the logarithmic normal distribution and its parameters. It was found that scatter under program, random, and biharmonic loading is identical and is similar to the scatter derived in constant amplitude tests in the life range of about 100,000 load cycles. This is true for life as well as for crack propagation. Miner's rule overestimates the scatter, which occurs in tests simulating irregularly varying service loads. An important influence on scatter is due to the testing machine. (Author)

AD-757 654 PC$3.00/MF$0.95
Naval Research Lab Washington D C
A REVIEW OF THE PLANE-STRESS FRACTURE MECHANICS PARAMETER KC DETERMINED USING THE CENTER-CRACKED TENSION SPECIMEN.
Special review rept.,
Anna M. Sullivan, and Charles N. Freed. 29 Dec 72, 51p Rept no. NRL-7460

Descriptors: (*Fracture (Mechanics), Experimental data), Metal plates, Cracks, Crack propagation, Notch sensitivity, Notch toughness, Stresses, Questionnaires.
Identifiers: *Fracture mechanics, Fracture toughness.

The report discusses the current status of the center-cracked tension (CCT) specimen as a means of determining the plane-stress fracture-mechanics parameter Kc. The effect of specimen geometry (width and crack length) together with that of specimen thickness is illustrated by examples from NRL research. The experimental parameters employed at NRL are detailed together with those in use at other laboratories for the purpose of assisting in the development of a standard procedure for such testing so that data can be reliably compared. (Author)

AD-757 726 MF$0.95
Naval Intelligence Support Center Washington D C Translation Div
STABILITY OF A CYLINDRICAL SHELL STIFFENED BY FRAMES AND LOADED WITH EXTERNAL PRESSURE (USTOICHIVOST TSILINDRICHESKOI OBOLOCHKI, PODKREPLENNOI SHAPANGOUTAMI I NAGRUZHENNOI VNESHIM DAVLENIVEM),
A. I. Manevich. 2 Feb 73, 11p Rept no. NISC-Trans-3389
Trans. of Akademiya Nauk SSSR. Izvestiya. Mekhanika, n6 p106-110 1965.
Availability: Available in microfiche only.

Descriptors: (*Structural shells, Stiffened cylinders), (*Stiffened cylinders, Stability), Loading (Mechanics), Structural properties, Stresses, Boundary value problems, USSR.
Identifiers: Translations, *Cylindrical shells.

The problem of determining the minimum rigidity of frames stabilizing a given cylindrical shell under a given external pressure is examined.

N73-16908 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
MIXED FINITE-DIFFERENCE SCHEME FOR FREE VIBRATION ANALYSIS OF NONCIRCULAR CYLINDERS.
A. K. Noor, and W. B. Stephens. Feb 73, 30p
NASA-TN-D-7107, E-8288

Descriptors: *Finite difference theory, *Shell stability, *Shell theory, *Shells (structural forms), *Structural vibration, Eigenvalues, Eigenvectors, Elastic properties, Numerical analysis, Structural analysis.

For abstract, see STAR 11 07.

N73-16909 PC$3.00/MF$0.95
Vought Aeronautics, Dallas, Tex.
FATIGUE EVALUATION OF COMPOSITE-REINFORCED INTEGRALLY STIFFENED METAL PANELS SUMMARY.
C. E. Dumesnil. Feb 73, 32p NASA-CR-2136
Contract NAS1-10871

Descriptors: *Composite structures, *Fatigue tests, *Metal plates, *Reinforced plates, Cracking (fracturing), Fatigue (materials), Service life, Structural stability.

For abstract, see STAR 11 07.

N73-16910 PC$3.00/MF$0.95
Lehigh Univ., Bethlehem, Pa. Inst. of Fracture and Solid Mechanics.
TWO BONDED HALF PLANES WITH A CRACK GOING THROUGH THE INTERFACE.
F. Erdogan, and V. Biricikoglu. Feb 73, 45p
NASA-CR-2181
Contract NGR-39-007-011

Descriptors: *Cauchy integral formula, *Crack propagation, *Cracking (fracturing), *Elastic media, *Half planes, *Structural analysis, *Structural strain, Mechanical properties, Numerical analysis, Stress analysis.

For abstract, see STAR 11 07.

N73-16923 PC$3.00/MF$0.95
National Aerospace Lab., Tokyo (Japan).
TRANSIENT THERMAL STRESSES OF THE HOLLOW CYLINDER SUBJECTED UNIFORM INNER HEATING.
K. Egawa, and Y. Takenaka. May 72, 16p
NAL-TR-287
Language Japanese English Summary

Descriptors: *High temperature tests, *Reliability analysis, *Strain gages, Adiabatic conditions, Cylinders, Thermal stresses.

For abstract, see STAR 11 07.

RFP-TRANS-118 PC$3.00/MF$0.95
ON THE RELATION OF A RECORDED VALUE OF ACOUSTIC EMISSION TO THE SIZES OF THE CRACKS.
Akira. Kamio. 4p

Descriptors: *Acoustic emission testing.

For abstract, see NSA 27 06, number 14418.

20L. Solid-State Physics

AD-757 097 PC$3.00/MF$0.95
California Univ Riverside Dept of Physics
ON THE INTERPRETATION OF AC CONDUCTIVITY IN AMORPHOUS SEMICONDUCTORS,
M. Pollak. Feb 73, 47p
Contract N00014-69-A-0200-5005

Descriptors: (*Semiconductors, Electrical conductance), Alternating current, Carriers (Semiconductors), Tunneling (Electronics), Phonons.
Identifiers: *Amorphous semiconductors, Polarons.

An extensive survey of the experimental literature on ac conductivity and on the dielectric dispersion in glasses is reported. Research is focused on the region where sigma = A (omega to the s power), s approximately equal to 1. The various materials seem to fall into two groups. The characteristic features of the one are a relative insensitivity of both A and s to temperature, with s approximately equal to 0.8. In the second group A increases as a high power of T, while s varies from about 1 at low temperatures to about 0.8 at high temperatures. A variety of possible models is examined in some detail. It is found that the behavior of the first group is well explained by phonon assisted hopping, while the other group can be explained either by hopping over a barrier, or by phonon assisted hopping with a subsequent lattice relaxation (e.g. polaron hopping). (Author)

AD-757 121 Not available NTIS
Mcmaster Univ Hamilton (Ontario) Inst for Materials Research
BOMBARDMENT-INDUCED AMORPHIZATION IN WO3 AND ITS USE IN DEDUCING MEAN DAMAGE RANGES (STUDIES ON BOMBARDMENT-INDUCED DISORDER. VI),
Nghi Q. Lam, and Roger Kelly. 28 Feb 72, 10p
Summary in French.
Availability: Pub. in Canadian Jnl. of Physics, v50 n17 p1887-1895, 1 Sep 72.

Descriptors: (*Tungsten compounds, *Ion bombardment), Oxides, Crystal lattice defects, Canada, Krypton, Radiation damage.
Identifiers: *Tungsten oxides.

WO3, though at first sight simply another example of an anisotropic oxide subject to bombardment-induced amorphization, has particular importance in that the depth of the amorphization (R (a)) can be estimated with great accuracy. The procedure is based on preparing anodic WO3, crystallizing it on its metal substrate at 350 or 450C, bombarding it, and then making direct use of the brilliant interference colors. Only Kr impact was studied, the values of R (a) being found to lie in the region of 50 to 390 A for Kr energies of 4 to 35 keV. It is argued that such values of R (a) can be used to deduce the mean damage range. (Author Modified Abstract)

AD-757 124 Not available NTIS
Mcmaster Univ Hamilton (Ontario) Inst for Materials Research
ON THE INCREASE IN THE ELECTRICAL CONDUCTIVITY OF MOO3 AND V205 FOLLOWING ION BOMBARDMENT. STUDIES ON BOMBARDMENT-ENHANCED CONDUCTIVITY-I,
H. M. Naguib, and R. Kelly. 6 Dec 71, 12p
Availability: Pub. in Jnl. of Physical and Chemical Solids, v33 p1751-1759 1972.

Descriptors: (*Oxides, Ion bombardment), (*Molybdenum compounds, Electrical conductance), (*Vanadium compounds, Electrical conductance), (*Radiation damage, Oxides), Electron diffraction analysis, Canada.
Identifiers: *Molybdenum oxides, *Vanadium oxides.

Measurements of the sheet conductivity of ion-bombarded MoO3 and V2O5 have shown that there is a conductivity increase of many orders of magnitude for doses of about 2x10 to the 16th power to about 2x10 to the 17th power ions/sq cm of 40-keV Kr, the final bulk conductivities being 20-200/0hm-cm for MoO3 and 20-600/ohm-cm for V2O5. Reflection electron diffraction indicates major structural changes in the irradiated materials. (Author Modified Abstract)

AD-757 129 Not available NTIS
Mcmaster Univ Hamilton (Ontario) Inst for Materials Research
ON THE AMORPHIZATION OF SI AND WO3 BY PARTICLE IMPACT. STUDIES ON BOMBARDMENT-INDUCED DISORDER, V,
Roger Kelly, and Nghi Q. Lam. 30 Jun 71, 6p
Availability: Pub. in Radiation Effects, v10 p247-252 1971.

Descriptors: (*Silicon, Ion bombardment), (*Tungsten compounds, Ion bombardment), (*Radiation damage, Crystal lattice defects), Oxides, Canada.
Identifiers: Ion implantation, *Tungsten oxides, Amorphous materials, Order disorder transformations.

Estimates of the depth of bombardment-induced amorphization (R sub a) are presently available for seven different ions injected into Si (Ar, As, B, Ne, P, Sb and Si) as well as for Kr injected into WO3. These depths can be interpreted in terms of recent damage-distribution theories to yield F sub d (R sub a), the initial displacement fraction at depth R sub a. (Here the term 'initial' means 'present before thermal and athermal annealing'.) The resulting values of F sub d (R sub a) were found to be reasonably constant, such that, depending on which theory was used, they had an average of either 0.7 plus or minus 0.2 or 0.4 plus or minus 0.2 for Si and either 0.9 plus or minus 0.03 or 0.17 plus or minus 0.06 for WO3. It is concluded, in view of the constancy of F sub d (R sub a), that the amorphization of Si and WO3 can be self-consistently explained by homogeneous damage accumulation. (Author Modified Abstract)

AD-757 134 Reprint
Cornell Univ Ithaca N Y Baker Lab
RIGOROUS INEQUALITIES FOR CRITICAL-POINT CORRELATION EXPONENTS,
Michael E. Fisher. 27 Nov 68, 7p
Sponsored in part by the Advanced Research Projects Agency, Arlington, Va. and National Science Foundation, Washington, D.C.
Availability: Pub. in The Physical Review, v180 n2 p594-600, 10 Apr 69.

Descriptors: (*Ferromagnetic materials, Mathematical models), Free energy, Thermodynamics, Crystal lattices.
Identifiers: *Ising model, *Ising ferromagnets, Spin lattice interactions.

Simple rigorous proofs are given for inequalities describing the decay of the spin-spin correlation function in a d-dimensional ferromagnet near its critical point. The notation is standard, but new, refined definitions of the exponents describing the correlation function are used in the proofs. The proofs are based on general and 'intuitively obvious' positivity and monotonicity properties of ferromagnetic correlation functions. The necessary properties (and certain supplementary lemmas) can be established rigorously for Ising models of arbitrary spin, lattice structure, and ferromagnetic coupling.

AD-757 223 PC$3.00/MF$0.95
Brandeis Univ Waltham Mass Dept of Physics
EXPERIMENTAL STUDIES OF PHASE TRANSITIONS.
Final summary rept.,
Peter Heller, and William S. Gornall. Mar 73, 9p
AFOSR-TR-73-0094
Grant AF-AFOSR-2247-72

Descriptors: (*Magnetic materials, Magnetic properties), (*Gases, Phase studies), Test methods, Antiferromagnetism, Neutron scattering, Simulation, Magnetic resonance, Raman spectroscopy.
Identifiers: Computerized simulation.

Phase transitions have been investigated using neutron scattering, computer simulation and magnetic resonance techniques. Particular attention has been given to dynamical properties. This includes a study of the coupling of the energy density and order parameter fluctuations in antiferromagnets. The time average behavior in the spin-flopped state has also been studied. In addition Raman scattering spectroscopy has been used to initiate a study of noble gases at temperatures near the condensation point. (Author)

AD-757 232 PC$3.00/MF$0.95
Pennsylvania State Univ University Park Dept of Physics
TRANSPORT OF ELECTRONS AND HOLES IN SEMI-CONDUCTORS.
Final rept.,
John P. McKelvey. 1 Mar 73, 12p AFOSR-TR-73-0463
Grant AF-AFOSR-1773-69

Descriptors: (*Carriers (Semiconductors), Transport properties), Germanium, Silicon, Gallium compounds, Phosphides, Lead compounds, Iodides, Phonons, Hall effect, Photoelectric effect, Stresses, Hydrostatic pressure, Cryogenics.
Identifiers: Gallium phosphides, Lead iodides, Carrier lifetime.

Work related to the investigation of excess carrier lifetime as a function of hydrostatic pressure in germanium, to the investigation of high-stress piezodrift effects in p-type germanium, and to the investigation of high-stress piezoresistance of p-type germanium has been completed and published. Studies involving transport behavior of charge carriers in silicon and gallium phosphide are being continued. Apparatus has been constructed to perform the required transport measurements down to 4 degrees K under high uniaxial stress. Work directed toward the construction of the phonon spectrum of lead iodide crystals is being continued. Coupling on consultation activities are briefly described. A list of degrees awarded and articles published under the sponsorship of the grant is included. (Author Modified Abstract)

AD-757 317 Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
INTERMEDIATE MIXED STATE MAGNETIZATION MEASUREMENTS,
F. Rothwarf, C. T. Rao, and L. W. Dubeck. 22 Jun 72, 4p
Availability: Pub. in Solid State Communications, v11 p1123-1125 1972.

Descriptors: (*Superconductors, Magnetic properties), (*Lead alloys, Magnetic properties), (*Thallium alloys, Magnetic properties), (*Niobium, Magnetic properties), Magnetic moments, Magnetic fields.
Identifiers: Ginzburg-Landau theory, Type 2 superconductors, Fluxoids.

Magnetization measurements on Pb-Tl and niobium samples with the Ginzburg-Landau parameter between 0.71 and 1 demonstrate the behavior to be expected of a sample in the intermediate-mixed state of Type II superconductors. In particular, the magnetization curve is intrinsically irreversible. (Author)

AD-757 372 Reprint
Army Electronics Technology and Devices Lab Fort Monmouth N J
ELECTROMAGNETIC EFFECTS IN MAGNETIC INSULATORS,
Maurice Weiner. 18 Aug 71, 10p
Availability: Pub. in Jnl. of Applied Physics, v43 n3 p1246-1255 Mar 72.

Descriptors: (*Magnetic materials, Electromagnetic properties), Yttrium compounds, Iron compounds, Garnet, Resonant frequency, Magnetic fields.
Identifiers: *Yttrium iron garnets, Magnons.

Electromagnetic modes are capable of strong coupling to magnetostatic modes in magnetic insulators. For certain ranges of magnetic field bias (or, equivalently, sample dimension), the two modes interact and lose their identity. This composite mode has been investigated both experimentally and theoretically. The experiment centered on the modes found in a small YIG sample coupled to an electromagnetic resonator in the form of a rutile disk and on the modes in a large YIG sphere (which forms its own electromagnetic resonator). Coupled-mode theory was applied to the experimental results. The theory has been extended to include the effects of relaxation, nonlinearities, and mode segregation, i.e., the frequency separation of the coupled mode from the allowed frequencies in the low-frequency spinwave manifold (e.g., ferromagnetic or acoustic ferrimagnetic spinwaves). A careful study has been conducted on these segregated modes. (Author Modified Abstract)

AD-757 432 PC$3.00/MF$0.95
Wyoming Univ Laramie Dept of Physics and Astronomy
A STUDY OF ELECTRONIC STATES AND TRANSPORT IN AMORPHOUS SEMICONDUCTORS.
Final rept. 2 Jun 70-31 May 72,
Shinzo Nakai. 31 May 72, 12p
Contract N00014-70-A-0266-0001

Descriptors: (*Semiconductors, Electrical properties), Impurities, Electrical conductance, Germanium, Antimony, Hall effect, Band theory of solids.
Identifiers: *Amorphous semiconductors.

The author investigated impurity conduction in doped semiconductors using the Green's function method for high inpurity concentrations at temperatures near zero.

AD-757 435 PC$3.00/MF$0.95
Pennsylvania Univ Philadelphia Dept of Physics
FINAL REPORT,
Herbert Callen. 30 Jul 72, 12p
Contract N00014-67-A-0216-0011

Descriptors: (*Semiconductors, Magnetic materials), Scientific research, Reviews, Europium compounds, Sulfides, Green's function, Nuclear magnetic resonance, Crystals, Liquids, Antiferromagnetism, Garnet, Impurities.
Identifiers: *Magnetic semiconductors, *Liquid crystals, Europium sulfides, Magnetic bubble domains, Heisenberg ferromagnets.

The initial focus of the project was magnetic semiconductors and the magnetic aspects of the Mott transition. In the last year of the project a considerable amount of work was done on magnetic bubble materials. Also liquid crystals have been investigated, and a variety of problems in impurity states in magnetic materials, and in the general theory of magnetic interactions.

AD-757 468 PC$3.00/MF$0.95
Army Foreign Science and Technology Center Charlottesville Va
EFFECTS OF NEUTRON IRRADIATION ON THE ELECTRICAL PROPERTIES OF INDIUM ARSENIDE (VLIYANIE NEITRONNOGO OBLUCHENIYA NA ALEKTRICHESKIE SVOISTVA ARSENIDA INDIYA),
B. I. Boltake, and E. P. Savin. 12 Jan 73, 10p Rept no. FSTC-HT-23-1435-72
Trans. from Radiatsionnaya Fizika (USSR) p116-123 n.d.

Descriptors: (*Semiconductors, *Radiation damage), (*Indium compounds, Neutron reactions), Single crystals, Arsenides, Electrical properties, Carriers (Semiconductors), Annealing, USSR, Crystal lattice defects.
Identifiers: Translations, *Indium arsenides, Carrier mobility.

The article discussed the results of research into radiation defects, arising in neutron irradiation of n- and p-type indium arsenide, and their effect on the electrical properties of crystals, as well as the results of studies of the kinetics of annealing these defects. (Author Modified Abstract)

AD-757 469 PC$3.00/MF$0.95
Army Foreign Science and Technology Center Charlottesville Va
SOME ELECTRICAL AND THERMOELECTRIC PROPERTIES OF SOLID SOLUTIONS OF GAAS-CDS,
A. V. Voitsekhovskii. 10 Jan 73, 6p Rept no. FSTC-HT-23-1437-72
Trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Fizika (USSR) n5 (96) p153-155 1970.

Descriptors: (*Semiconductors, Electrical properties), Electrical conductance, Solid solutions, Gallium arsenides, Cadmium sulfides, Seebeck effect, Hall effect, USSR.

Identifiers: Translations.

Measurements of specific conductance, Hall effect constant and differential thermoelectromotive force were carried out by the compensation method on solid solutions of GaAs-CdS. (Author Modified Abstract)

AD-757 521 PC$3.00/MF$0.95
University of Southern California Los Angeles Electronic Sciences Lab
CONSOLIDATED SEMIANNUAL PROGRESS REPT NO. 16 COVERING RESEARCH ACTIVITY DURING THE PERIOD 1 APRIL 1972 THROUGH 30 SEPTEMBER 1972,
Z. A. Kaprielian. 30 Sep 72, 77p AFOSR-TR-73-0502
Contract F44620-71-C-0067
See also Consolidated semiannual progress rept. no. 15, AD-751 515.

Descriptors: (*Solid state physics, Reviews), (*Lasers, Reviews), (*Information theory, Reviews), Semiconductors, Magnetism, Semiconductor devices, Metallurgy, Crystal lattice defects, Electrochemistry, Band theory of solids, Control systems, Communication systems, Automata, Plasma physics, Computers.
Identifiers: Quantum electronics, Automata theory, Control theory, Sequential machines.

Contents:
- Materials and semiconductors;
- Quantum electronics;
- Magnetism;
- Metals, alloys and low temperature physics;
- Solid state devices;
- Defect chemistry and solid state electrochemistry;
- Plasmas and applied electromagnetics;
- Control systems;
- Communication systems;
- Computer systems and automata theory;
- Electric power systems;
- Mathematical biosciences and biomedical engineering.

AD-757 555 PC$3.00/MF$0.95
Stanford Univ Calif Microwave Lab
MICROWAVE ACOUSTIC AND BULK DEVICE TECHNIQUE STUDIES.
Interim technical rept. no. 5, 1 May-31 Oct 72,
Marvin Chodorow, and H. J. Shaw. Jan 73, 37p
Rept no. ML-2108 RADC-TR-73-3
Contract F30602-71-C-0125
See also report dated Jul 72, AD-747 047.

Descriptors: (*Semiconductor devices, Ultrasonic radiation), (*Delay lines, Niobates), Lithium compounds, Piezoelectric crystals, Piezoelectric transducers, Amplifiers, Gallium arsenides, Integral transforms.
Identifiers: *Microwave acoustics, Acoustic surface waves, Acoustic wave amplifiers, Surface waves, Acoustic delay lines, Signal processing, Lithium niobates, Fast Fourier transform.

The objectives of the contract are to advance new theory and device techniques for the generation and processing of microwave signals using elastic, electro-magnetic, and carrier space charge waves in solid media. The work is divided into three projects, as follows: bulk and surface acoustic wave amplifiers, axoustic parametric interactions, wide bandwidth dispersive delay lines. Significant results include broadband efficient excitation in an amplifier with net gain; a new convolution device with 30 db greater interaction strength than with lithium niobate; and a bulk wave device for convolution/correlation, time reversal, and Fast Fourier transform of arbitrary signals. Work on wide bandwidth dispersive delay lines has led to the achievement of lines with near octave bandwidth, centered at 200 MHz, and linear dispersion characteristics. (Author)

AD-757 559 PC$3.00/MF$0.95
Massachusetts Inst of Tech Lexington Lincoln Lab
SOLID STATE RESEARCH, 1972:4.
Quarterly technical summary rept. 1 Aug-31 Oct 72,
Alan L. McWhorter. 15 Nov 72, 69p ESD-TR-72-259
Contract F19628-73-C-0002
See also AD-752 556.

Descriptors: (*Solid state physics, Scientific research), (*Semiconductors, Scientific research), Photodiodes, Lasers, Indium antimonides, Lead compounds, Sulfides, Tellurides, Selenides, Diodes (Semiconductor), Gallium arsenides, Irasers, Band theory of solids, Phosphorescent materials, Pumping (Optical), Thermal insulation, Vanadium compounds, Oxides, Chromates, Microminiaturization (Electronics).
Identifiers: *Semiconductor lasers, Laser spectroscopy.

The report covers in detail the solid state research work of the Solid State Division at Lincoln Laboratory for the period 1 August through 31 October 1972. The topics covered are Solid State Device Research, Quantum Electronics, Materials Research, Physics of Solids and Microelectronics. The Microsound work is sponsored by ABMDA and is reported under this program. (Author)

AD-757 576 Reprint
Columbia Univ New York Dept of Civil Engineering and Engineering Mechanics
ON UNIQUENESS IN IDEALLY ELASTOPLASTIC PROBLEMS IN CASE OF NONASSOCIATED FLOW RULES.
Technical rept.,
Hans H. Bleich. Oct 71, 6p Rept no. TR-48
Contract N00014-67-A-0108-0029
Presented at the Applied Mechanics Summer Conference, California Univ., La Jolla, 26-28 Jun 72, of the American Society of Mechanical Engineers. (Paper No. 72-APM-33). Revision of report dated May 71.
Availability: Pub. in Jnl. of Applied Mechanics, p983-987 Dec 72.

Descriptors: (*Plasticity, Continuum mechanics), Loading (Mechanics), Stresses, Strain (Mechanics), Numerical analysis, Solids.
Identifiers: Elastoplasticity.

It is known that in the quasi-static treatment of ideally elastoplastic solids, lack of uniqueness may occur unless associated flow rules are used. This has been illustrated by a simple example in a reference. The present study shows that the uniqueness difficulties in the foregoing and in similar situations disappear, if inertia forces are included in the analysis. (Author Modified Abstract)

AD-757 577 Reprint
State Univ of New York Albany Dept of Physics
ELECTRON SPIN RESONANCE STUDIES OF NEUTRON-IRRADIATED DIAMOND,
Y. M. Kim, Y. H. Lee, P. Brosious, and J. W. Corbett. 1972, 8p
Contract N00014-70-C-0296
Availability: Pub. in 1972 Defects in Semiconductors: Session 4, Paper 23, p202-209 1972.

Descriptors: (*Diamonds, Defects (Materials)), Radiation damage, Neutron reactions, Electron spin resonance, Tensor analysis.
Identifiers: Interstitials.

Electron spin resonance (ESR) studies have been made of fast neutron-irradiated diamond crystals. Two new S=1 centres have been observed. The D tensor analysis of S=1 centres and new interstitial configurations, split-<100>and bond-centred, are employed in establishing models of defects which might give rise to these spectra. The newly-gained understanding of the interstitial configurations is also extended to the previously-identified ESR spectra to establish defect models. (Author)

AD-757 578 Reprint
State Univ of New York Albany Dept of Physics
MECHANISMS OF DEFECT PRODUCTION,
J. W. Corbett, J. C. Bourgoin, and C. Weigel. 1972, 16p
Contract N00014-70-C-0296
Availability: Pub. in 1972 Defects in Semiconductors: Invited Paper, p1-16 1972 (Paper 1).

Descriptors: (*Semiconductors, Radiation damage), (*Silicon, Defects (Materials)), (*Diamonds, Defects (Materials)), Atomic structure, Impurities, Carbon, Band theory of solids.
Identifiers: Interstitials.

Recent theoretical work on the configuration of the interstitial argues that the self-interstitial in diamond and silicon is an interstitialcy configuration rather than the tetrahedral or hexagonal configuration. The authors argue here that these results imply a theoretical estimate of the adiabatic displacement energy which is about one half earlier estimates. The authors discuss the interatomic potential in a covalent semiconductor and the prospects for dynamic damage calculations in these materials and calculations are given on diamond and on silicon which suggest that the Frenkel pair are created as charged defects, for example I (+) and V (-), giving rise to a coulombic contribution to the displacement energy. (Author Modified Abstract)

AEEW-R-815 PC$3.00/MF$0.95
Atomic Energy Establishment, Winfrith (England).
SPECIFIC HEAT OF GRAPHITE- AN EVALUATION OF MEASUREMENTS.
A. T. D. Butland, and R. J. Maddison. Oct 72, 22p
U. S. Sales only

Descriptors: *Graphite.

For abstract, see NSA 27 06, number 12568.

ANU-P-560 PC$3.00/MF$0.95
Australian National Univ., Canberra.
FURTHER EVIDENCE AGAINST A CHANNELING EFFECT IN THE OPTICAL EXCITATION OF ION BEAMS TRANSMITTED THROUGH SINGLE CRYSTALS OF GOLD.
C. S. Newton, R. J. Macdonald, C. J. Sofield, and H. J. Hay. 1971, 6p
U. S. Sales only

Descriptors: *Gold, *Helium ions.

For abstract, see NSA 27 06, number 12965.

BNL-17330 PC$3.00/MF$0.95
Brookhaven National Lab., Upton, N. Y.
ABSOLUTE MEASUREMENT OF THE TRANSVERSE K-DEPENDENT SUSCEPTIBILITY IN ANTIFERROMAGNETIC MNF/SUB 2/.
N. A. Lurie, G. Shirane, P. Heller, and A. Linz. 1972, 5p CONF-721114-14
From 18. Annual Conference On Magnetism And Magnetic Materials- Denver, Co (28 Nov 1972).

Descriptors: *Manganese fluorides.

For abstract, see NSA 27 06, number 14347.

BNL-17336 PC$3.00/MF$0.95
State Univ. Of New York, Stony Brook. Brookhaven National Lab., Upton, N. Y.
SPIRAL STRUCTURE OF BA/SUB 2/COREO/SUB 6/.
C. P. Khattak, D. E. Cox, and F. F. Y. Wang. 1972, 5p CONF-721114-13
From 18. Annual Conference On Magnetism And Magnetic Materials- Denver, Co (28 Nov 1972).

Descriptors: *Barium cobalt rhenates.

For abstract, see NSA 27 06, number 14348.

BNL-17346 PC$3.00/MF$0.95
Brookhaven National Lab., Upton, N. Y.
MAGNETIC PHASE TRANSITION IN FECL/SUB 3/.
Y. Endoh, J. Skalyo Jr, W. T. Ooterhius, and J. P. Stampfel. 1972, 4p CONF-721114-2
From 18. Annual Conference On Magnetism And Magnetic Materials- Denver, Co (28 Nov 1972).

Descriptors: *Iron chlorides.

For abstract, see NSA 27 06, number 14350.

BNL-17456 PC$3.00/MF$0.95
Brookhaven National Lab., Upton, N. Y.
DEFECT STATE ANALYSIS.
A. N. Goland. 1972, 15p CONF-721205-1
From Meeting On Critical Questions In Fundamental Radiation Damage Research- Washington, D. C. (5 Dec 1972).

Descriptors: *Radiation, *Solids.

For abstract, see NSA 27 06, number 13824.

CEA-CONF-2110 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Fontenay-Aux-Roses (France). Centre D'Etudes Nucleaires.
HEAVY PARTICLE CHANNELING.
Jean Mory. 1972, 26p CONF-720962-1
Lang- In French. From Modern Observation Methods In Physical Metallurgy Conference- Villard-de-lans, France (18 Sep 1972). U. S. Sales only

Descriptors: *Charged particles, *Crystals, *Solids.

For abstract, see NSA 27 06, number 13825.

CEA-R-4314 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Grenoble (France). Centre D'Etudes Nucleaires.
APPLICATION OF THE PERTURBED ANGULAR CORRELATION TECHNIQUE TO THE STUDY OF QUADRUPOLE COUPLING IN SOLIDS.
Pierre Boyer. Jul 72, 144p
Lang- In French. Thesis. U. S. Sales only

Descriptors: *Hafnium, *Tantalum isotopes ta- 8 .

For abstract, see NSA 27 06, number 13865.

CEA-R-4389 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Saclay (France). Centre D'Etudes Nucleaires.
METHOD OF CALCULATING THE NUMBER OF ATOMS DISPLACED IN IRRADIATED METALS.
M. J. Norgett, M. T. Robinson, and I. M. Torrens. Dec 72, 12p
Lang- In French. U. S. Sales only

Descriptors: *Metals.

For abstract, see NSA 27 06, number 13826.

CEA-R-4391 PC$3.00/MF$0.95
Commissariat A L'Energie Atomique, Fontenay-Aux-Roses (France). Centre D'Etudes Nucleaires.
STUDY OF THE ELECTRONIC STRUCTURE OF ALLOYS AND ACTINIDES.
J. P. Gatesoupe. Dec 72, 61p
Lang- In French. Thesis. U. S. Sales only

Descriptors: *Copper alloys and systems, *Lanthanum alloys and systems, *Neptunium alloys and systems, *Plutonium alloys and systems, *Scandium alloys and systems, *Thorium alloys and systems, *Titanium alloys and systems, *Uranium alloys and systems, *Yttrium alloys and systems, *Zirconium alloys and systems.

For abstract, see NSA 27 06, number 13866.

COM-73-50201 Not available NTIS
National Bureau of Standards, Washington, D.C.
LARGE LOCALIZED SURFACE STRESSES CAUSED BY THERMAL EXPANSION ANISOTROPY.
Final rept.,
J. B. Wachtman, Jr., and J. Dundurs. 1971, 2p
Pub. in Jnl. of the American Ceramic Society, v54 n10 p525-526 Oct 71.

Descriptors: (*Thermal stresses, Thermal expansion), Grain size, Anisotropy, Surface properties.

The stress in the surface of a polycrystalline solid arising from thermal expansion anisotropy is calculated from a model of an elastic sphere in a homogeneous material. The results depend strongly on the distance of the sphere from the surface and suggest that the usual calculation, which ignores the effect of the surface, seriously underestimates this stress. (Author)

COM-73-50219 Not available NTIS
National Bureau of Standards, Washington, D.C.
TRANSITION TEMPERATURES OF SYSTEMS WITH MIXED FERRO AND ANTIFERROMAGNETIC COUPLING.
Final rept.,
J. C. Edwards, and P. H. E. Meijer. 1972, 13p
Sponsored in part by Air Force Office of Scientific Research, Washington, D.C.
Pub. in Physica, v61 p67-79 1972.

Descriptors: (*Magnetic materials, Transition temperature), Antiferromagnetism, Ferromagnetism, Magnetic anisotropy, Critical temperature.
Identifiers: Ising model, Heisenberg model.

To study the influence of a mixture of ferromagnetic and antiferromagnetic couplings on the transition temperature of a spin-1/2 system the authors use the Bethe or constant-coupling method and applied it to two models; Model A, a system containing two types of atoms with different inter - and intra-spin coupling; Model B, a system which contains two antiferromagnetic sublattices that are ferromagnetically coupled. For reasonable values of the parameters it is found that the Curie temperature has the tendency to increase when the antiferromagnetic coupling is present, at least for the models considered using Ising and anisotropic Heisenberg coupling. The authors also develop an expression, based on model B, for the critical temperature of a spin-1 system. (Author)

COM-73-50237 Not available NTIS
National Bureau of Standards, Washington, D.C.
ANALYSIS OF COMPOSITION FLUCTUATION LIFETIMES IN A CRITICAL OXIDE MIXTURE BY VOLUME RELAXATION SPECTROSCOPY.
Final rept.,
Joseph H. Simmons, Pedro B. Macedo, and Vittorio Volterra. 1972, 11p
Pub. in Jnl. of Non-Crystal Solids, v11 n4 p357-367 Jan 73. Prepared in cooperation with Catholic Univ. of America, Washington, D.C. under Grant AF-AFOSR-2203-72.

Descriptors: (*Oxides, Relaxation (Mechanics)), Volume, Ultrasonic tests, Temperature, Critical point, Vitreous state.

The distribution of volume relaxation times in a critical oxide mixture is calculated from longitudinal and shear modulus measurements. Ultrasonic relaxation allows the investigation of two distinct effects in the distribution of relaxation times as the temperature is lowered toward the critical point. At high temperatures, a coupling between the compressional component of the ultrasonic wave and supercritical fluctuations in composition leads to an anomalous broadening of the distribution of volume relaxation times. This interaction allows a measure of the average composition fluctuation lifetime as a function of temperature. At lower temperatures, the behavior of the distribution follows closely the predictions of an environmental relaxation model proposed by these authors for the analysis of shear relaxation process in the same material. (Author Modified Abstract)

COO-1247-26 PC$3.00/MF$0.95
Michigan State Univ., East Lansing.
TRANSPORT AND DEFECT PROPERTIES OF THIN METALLIC WIRES. PROGRESS REPORT NO. 9. FINAL REPORT.
Jack Bass. 15 Sep 72, 31p
Contract AT (11-1)-1247

Descriptors: *Metals, *Wires.

For abstract, see NSA 27 06, number 14364.

COO-2103-20 PC$3.00/MF$0.95
Northwestern Univ., Evanston, Ill. Dept. Of Physics. Argonne National Lab., Ill.
RELATIVISTIC ELECTRONIC BAND STRUCTURE AND PROPERTIES OF THE HEAVIER ACTINIDES- A SECOND RARE-EARTH SERIES.
D. D. Koelling, and A. J. Freeman. 1972, 5p CONF-721114-9
From 18. Annual Conference On Magnetism And Magnetic Materials- Denver, Co (28 Nov 1972).

Descriptors: *Actinides, *Americium, *Berkelium, *Curium, *Plutonium.

For abstract, see NSA 27 06, number 13867.

COO-2103-22 PC$3.00/MF$0.95
Argonne National Lab., Ill.
ELECTRONIC STRUCTURE AND MAGNETIC PROPERTIES OF SCANDIUM.
S. G. Das, A. J. Freeman, D. D. Koelling, and F. M. Mueller. 1972, 6p CONF-721114-15
From 18. Annual Conference On Magnetism And Magnetic Materials- Denver, Co (28 Nov 1972).

Descriptors: *Scandium.

For abstract, see NSA 27 06, number 13868.

COO-3150-9 PC$3.00/MF$0.95
Cornell Univ., Ithaca, N. Y. Lab. Of Atomic And Solid State Physics.
HALL COEFFICIENT OF POTASSIUM DETERMINED BY A HELICON TRANSMISSION METHOD. REPORT 1910.
D. E. Chimenti, and B. W. Maxfield. Nov 72, 35p

Descriptors: *Potassium.

For abstract, see NSA 27 06, number 14376.

COO-3151-11 PC$3.00/MF$0.95
Cornell Univ., Ithaca, N. Y. Lab. Of Atomic And Solid State Physics.
FAR INFRARED MEASUREMENT OF THE ENERGY GAP OF V/SUB 3/SL REPORT 1880.
D. B. Tanner, and A. J. Sievers. Sep 72, 13p

Descriptors: *Vanadium silicides.

For abstract, see NSA 27 06, number 13337.

IEA-256 PC$3.00/MF$0.95
Instituto De Energia Atomica, Sao Paulo (Brazil).
CONTINUOUS MODEL FOR TL TRAPS.
Shigueo Watanabe, and Spero Penha Morato. Dec 71, 18p
U. S. Sales only

Descriptors: *Fluorites, *Gamma radiation, *Lithium fluorides, *Thermoluminescence.

For abstract, see NSA 27 06, number 13829.

INP-868 PC$3.00/MF$0.95
Institute Of Nuclear Physics, Krakow (Poland).
ATOMIC AND MAGNETIC STRUCTURE OF THE HEUSLER ALLOYS.
Andrzej Szytula. Mar 72, 100p
Lang- In Polish. U. S. Sales only

Descriptors: *Alloys.

For abstract, see NSA 27 06, number 14381.

JINR-P9-6787 PC$3.00/MF$0.95
Joint Inst. For Nuclear Research, Dubna (Ussr).
REFLECTION OF MOVING CHARGES AND CURRENT IN METAL.
Yu. I. Aleksakhin, and A. G. Bonch-Osmolovskii. 1972, 12p
Lang- In Russian. U. S. Sales only

Descriptors: *Charged particles, *Metals.

For abstract, see NSA 27 06, number 14390.

KAPL-P-3948 PC$3.00/MF$0.95
Knolls Atomic Power Lab., Schenectady, N. Y.
TORSIONAL WAVE SCATTERING ABOUT A PENNY-SHAPED CRACK LYING ON A BI--MATERIAL INTERFACE.
J. F. Loeber, and G. C. Sih. Jun 72, 23p
Contract W-31-109-ENG-52

Descriptors: *Cracks, *Mechanical engineering.

For abstract, see NSA 27 06, number 14394.

KFKI-72-63 PC$3.00/MF$0.95
Magyar Tudomanyos Akademia Kozponti Fizikai Kutato Intezete, Budapest.
MOESSBAUER STUDY OF SNMN/SUB 3/C AND SNMN/SUB 3/N.
J. P. Senateur, and D. L. Nagy. 1972, 11p
U. S. Sales only

Descriptors: *Carbon systems, *Manganese alloys and systems, *Nitrogen systems, *Tin alloys and systems, *Tin isotopes sn- 9.

For abstract, see NSA 27 06, number 14399.

LBL-1138 PC$3.00/MF$0.95
California Univ., Berkeley. Lawrence Berkeley Lab.
LOW-TEMPERATURE HEAT CAPACITY OF ALPHA- AND BETA-CERIUM.
M. M. Conway, and N. E. Phillips. Aug 72, 10p
CONF-720833-26
Contract W-7405-ENG-48
From 13. International Conference On Low Temperature Physics- Boulder, Co (20 Aug 1972).

Descriptors: *Cerium.

For abstract, see NSA 27 06, number 13869.

NP-19623 PC$3.00/MF$0.95
Rome Univ. (Italy). Istituto Di Fisica.
TIME EVOLUTION OF A QUANTUM LATTICE SYSTEM. NOTE 393.
M. Pulvirenti, and B. Tirozzi. 19 Jul 72, 11p
U. S. Sales only

Descriptors: *Solid state physics.

For abstract, see NSA 27 06, number 14412.

TID-26221 PC$3.00/MF$0.95
United Aircraft Corp., East Hartford, Conn. Research Labs.
MEASUREMENTS OF THE UV AND VUV TRANSMISSION OF OPTICAL MATERIALS DURING HIGH-ENERGY ELECTRON IRRADIATION.
G. E. Palma. Sep 72, 51p L-990929-3
Contract SNPC-70

Descriptors: *Beryllium oxides, *Electrons, *Lithium fluorides, *Magnesium fluorides, *Silicon oxides.

For abstract, see NSA 27 06, number 13831.

TP-375 PC$3.00/MF$0.95
Atomic Energy Research Establishment, Harwell (England).
KINETICS OF VOID GROWTH DURING NEUTRON IRRADIATION.
R. Bullough. Aug 69, 10p
U. S. Sales only

Descriptors: *Neutrons, *Solids.

For abstract, see NSA 27 06, number 12401.

UCLA-34-P-201-4 PC$3.00/MF$0.95
California Univ., Los Angeles. Dept. Of Materials.
ELASTIC INTERACTION OF TETRAGONAL PRECIPITATES IN CUBIC CRYSTALS. SECOND TOPICAL PROGRESS REPORT, JANUARY 1-DECEMBER 31, 1972.
C. V. Hodge, and D. De Fontaine. Sep 72, 86p
UCLA-ENG-7292
Contract AT (04-3)-34

Descriptors: *Alloys, *Computer programs, *Metals.

For abstract, see NSA 27 06, number 14445.

UCRL-73923 (REV.1) PC$3.00/MF$0.95
California Univ., Livermore. Lawrence Livermore Lab.
MAGNITUDE AND EXTENDED ENERGY RANGE OF X-RAY K-ABSORPTION FINE STRUCTURE FOR TI, FE, CO, NI, CU, AND ZN.
N. K. Del Grande, and A. J. Oliver. Sep 72, 27p
CONF-720939-2
From International Symposium On X-ray Spectra And Electronic Structure Of Matter- Munich, Germany (18 Sep 1972).

Descriptors: *Cobalt, *Copper, *Iron, *Nickel, *Titanium, *Zinc.

For abstract, see NSA 27 06, number 13870.

UUIP-789 PC$3.00/MF$0.95
Uppsala Univ. (Sweden). Inst. Of Physics.
PAC-ISOTOPES- THE APPLICABILITY OF PERTURBED ANGULAR CORRELATION IN MAGNETISM.
E. Karlsson, R. A. Windahl, and D. W. Cruse. May 72, 54p
U. S. Sales only

Descriptors: *Data tabulations, *Gamma radiation, *Hyperfine structure, *Magnetic materials.

For abstract, see NSA 27 06, number 14451.

20M. Thermodynamics

AD-757 189 PC$3.00/MF$0.95
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
A NUMERICAL PROCEDURE FOR TWO DIMENSIONAL HEATING AND MELTING CALCULATIONS, WITH APPLICATIONS TO LASER EFFECTS.
Technical rept.,
Peter J. Torvik. Mar 72, 57p AFIT-TR-72-2

Descriptors: (*Conduction (Heat transfer), Numerical analysis), (*Disks, *Melting), Lasers, Thermal stresses, Heating, Difference equations, Equations of state, Computer programs, Alumina, Titanium, Stainless steel, Magnesium, Temperature, Transients.
Identifiers: Finite element analysis, Finite difference theory.

A method for determining the two dimensional transient temperature distribution and progression of melting in disks subjected to an applied flux over one face is given. The calculations are performed by dividing the solid into a number of finite elements and performing a heat balance over finite time increments. The method was found to give good agreement with known solutions for two dimensional heat conduction problems and one dimensional melting problems. Two dimensional melting problems in alumina, titanium, stainless steel, and magnesium are also considered as examples of the method. The results include a demonstration that the time required to melt through approaches the time predicted by a one dimensional (axial) heat balance if the power per unit thickness is sufficiently large. (Author)

AD-757 280 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
VAPORIZATION OF THIN LIQUID FILMS.
Master's thesis,
Donald Kenneth MacKenzie. Dec 72, 90p

Descriptors: (*Nucleate boiling, *Vaporization), (*Heat exchangers, Nucleate boiling), Water, Ethanols, Surfaces, Films, Nickel, Theses.
Identifiers: Thin films.

Experimental results are presented for saturated nucleate pool boiling of distilled water and ethyl-alcohol from 1-7/8 inch diameter Nickel disks with pool depths from 1.0 inch to a thin film of 0.015 inch. Experimental runs were conducted on a mirrorlike surface using distilled water and ethyl-alcohol; on a grooved surface with distilled water as the working fluid; and on a surface covered with 4 layers of Nickel 50 x 40 mesh with distilled water as the working fluid. Results show that liquid level has little effect on the heat transfer coefficient above a level of 0.2 inch on all three test surfaces; However, below 0.2 inch a rapid increase in the heat transfer coefficient occurs with the lowering of the liquid level. Two types of thin film dryout were noted on the mirrorlike surface: dryout under a dome and dryout in absence of a dome. A grooved surface appears to provide a means of obtaining a stable high heat transfer coefficient at liquid films as thin as 0.015 inch. (Author)

AD-757 313 Reprint
Army Electronics Command Fort Monmouth N J Inst for Exploratory Research
NOTES ON THE THERMODYNAMICS OF DIELECTRICS,
Herbert A. Leupold. 12 Mar 71, 3p
Revision of report dated 20 Jul 70.
Availability: Pub. in American Jnl. of Physics, v39 n9 p1099-1101 Sep 71.

Descriptors: (*Dielectrics, *Thermodynamics), Partial differential equations, Magnetic properties, Electrical properties, Paramagnetic materials.

In a previous paper by the author an attempt was made to clarify some of the rather common confusion regarding the first law of thermodynamics as applied to paramagnetic systems. This report draws analogy for the case of dielectric materials.

COO-1569-89 PC$3.00/MF$0.95
Minnesota Univ., Minneapolis. School Of Physics And Astronomy.
OBSERVATIONS OF THE SUPERFLUID CIRCULATION AROUND A WIRE IN A ROTATING VESSEL CONTAINING LIQUID HE-II.
S. F. Kral, and W. Zimmermann Jr. 1968, 10p
CONF-720833-22
From 13. International Conference On Low Temperature Physics- Boulder, Co. (20 Aug 1972).

Descriptors: *Helium/ superfluid.

For abstract, see NSA 27 06, number 13328.

COO-1574-31 PC$3.00/MF$0.95
Michigan State Univ., East Lansing. Dept. Of Physics.
PROPERTIES OF RARE-GAS SOLIDS. PROGRESS REPORT.
G. L. Pollack. 1972, 12p
Contract AT (11-1)-1574

Descriptors: *Helium/ superfluid, *Rare gases.

For abstract, see NSA 27 06, number 14367.

COO-3403-7 PC$3.00/MF$0.95
Pennsylvania Univ., Philadelphia. Dept. Of Chemistry.
ROTATIONAL ORDERING IN THE SOLID MOLECULAR HYDROGENS. PROGRESS REPORT NO. 7, OCTOBER 1, 1971-SEPTEMBER 30, 1972.
1972, 16p
Contract AT (11-1)-3403

Descriptors: *Hydrogen.

For abstract, see NSA 27 06, number 14378.

LA-4985 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
TIME-DEPENDENT SOLUTION TO INTERSTITIAL DIFFUSION IN A TEMPERATURE GRADIENT.
C. E. Lee, and T. C. Wallace. Nov 72, 29p
Contract W-7405-ENG-36

Descriptors: *Carbides, *Computer programs, *Diffusion, *Hydrides.

For abstract, see NSA 27 06, number 11921.

N73-16593 PC$5.00/MF$0.95
Bell Aerospace Co., Buffalo, N.Y.
FINITE ELEMENT SOLUTION FOR ENERGY CONSERVATION USING A HIGHLY STABLE EXPLICIT INTEGRATION ALGORITHM.
Final Technical Report, Jun. - Oct. 1972
A. J. Baker, and P. D. Manhardt. Oct 72, 56p
NASA-CR-130149, REPT-9500-920257
Contract NAS5-11935

Descriptors: *Algorithms, *Computer programming, *Conservation equations, *Finite element method, *Numerical integration, Conductive heat transfer, Continuum mechanics, Energy, Temperature distribution.

For abstract, see STAR 11 07.

N73-16926 PC$5.50/MF$0.95
Naval Postgraduate School, Monterey, Calif. Dept. of Mechanical Engineering.
AN ANALYTICAL AND EXPERIMENTAL INVESTIGATION OF ROTATING, NON-CAPILLARY HEAT PIPES.
Final Report
P. J. Marto. 30 Nov 72, 67p NASA-CR-130373, NPS-59MX72111A
NASA ORDER W-13007

Descriptors: *Film condensation, *Heat pipes, *Heat transfer, *Rotating bodies, Evaporative cooling, Operational problems, Performance.

For abstract, see STAR 11 07.

N73-16927 PC$5.25/MF$0.95
Bell Aerospace Co., Buffalo, N.Y.
COMOC THERMAL ANALYSIS VARIANT. USERS MANUAL.
Program Users Manual Jun. - Oct. 1972
A. M. Bauer, and A. J. Baker. Oct 72, 61p
NASA-CR-130148, REPT-9500-920256
Contract NAS5-11935

Descriptors: *Computer programs, *Heat transfer, Conductive heat transfer, Convective heat transfer, Differential equations, Finite element method, Problem solving.

For abstract, see STAR 11 07.

N73-16932 PC$3.00/MF$0.95
National Bureau of Standards, Boulder, Colo. Cryogenics Div.
ASRDI OXYGEN TECHNOLOGY SURVEY. VOLUME 3 HEAT TRANSFER AND FLUID DYNAMICS. ABSTRACTS OF SELECTED TECHNICAL REPORTS AND PUBLICATIONS.
A. F. Schmidt. 1972, 177p NASA-SP-3076-VOL-3
Subm- Sponsored By Nasa

Descriptors: *Bibliographies, *Fluid dynamics, *Heat transfer, *Liquid oxygen, Liquid helium, Liquid hydrogen, Liquid nitrogen, Missiles, Two phase flow, Weightlessness.

For abstract, see STAR 11 07.

SCL-RR-720324 PC$3.00/MF$0.95
Sandia Labs., Livermore, Calif.
COUPLE- A PSEUDO FINITE ELEMENT CONDUCTION CODE FOR THE TRANSIENT THERMAL RESPONSE OF AXISYMMETRIC OR PLANE ANISOTROPIC MATERIALS.
E. C. Lemmon. Dec 72, 88p
Contract AT (29-1)-789

Descriptors: *Computer programs, *Heat transfer.

For abstract, see NSA 27 06, number 14433.

UCID-15621 PC$3.00/MF$0.95
California Univ., Livermore. Lawrence Radiation Lab.
VARIABLE VAPOR VOLUME HEAT PIPES. SPACE POWER NOTE NO. 125.
R. Werner. 9 Aug 66, 8p

Descriptors: *Heat pipes.

For abstract, see NSA 27 06, number 14442.

20N. Wave Propagation

AD-757 080 PC$3.00/MF$0.95
Naval Electronics Lab Center San Diego Calif
WKB FIELDS PROGRAM FOR LOWER ELF.
Interim rept.,
Richard A. Pappert, and Linda R. Shockey. 2 Jan 73, 51p Rept no. NELC-IR-731

Descriptors: (*Radio transmission, *Extremely low frequency), Computer programs, Ionospheric propagation, Gain, Electric fields, Magnetic fields, Radio interference.
Identifiers: WKB approximation, FORTRAN, FORTRAN 4 programming language.

The report presents a Fortran IV WKB mode sum program developed for estimating round the world interference effects in the lower ELF band. The mode sum consists of the superposition of waves which travel over the long and short great circle paths to the observation point. WKB mode sum calculations are generated for the vertical electric field component, E (z), and the horizontal magnetic field component normal to the plane of propagation, H (y), excited by electric dipole sources of arbitrary elevation and orientation. (Author)

AD-757 198 PC$3.00/MF$0.95
Mitre Corp Bedford Mass
RADIO WAVE PROPAGATION IN THE PRESENCE OF A TROPOSPHERIC DUCT,
M. R. Dresp. Dec 72, 106p Rept no. MTR-2455
ESD-TR-72-323
Contract F19628-71-C-0002

Descriptors: (*Ionospheric propagation, Numerical analysis), Atmosphere models, Radio transmission, Troposphere, Attenuation, Ultrahigh frequency.
Identifiers: Atmospheric ducts.

A full-wave solution was obtained for radio wave propagation in the presence of an elevated tropospheric layer. The tropospheric layer is modeled as a trilinear refractive index profile with a sufficient lapse rate so as to result in an elevated duct. The analytical solutions give the received signal level for air-to-air propagation paths at UHF, the corresponding signal fading level, and the space diversity distance to insure good quality reception. The analysis performed here can be applied to ionospheric propagation and to the underwater acoustic channel. (Author)

AD-757 341 PC$3.00/MF$0.95
Naval Electronics Lab Center San Diego Calif
COMPUTER TECHNIQUES FOR FITTING ELECTRON DENSITY PROFILES TO OBLIQUE-PATH VLF PROPAGATION DATA.
Research and development rept. Jan 70-Oct 72,
D. G. Morfitt. 16 Jan 73, 40p Rept no. NELC-TR-1854

Descriptors: (*Ionospheric propagation, Very low frequency), (*Ionosphere, Electron density), Periodic variations, Curve fitting, Graphics, California, Hawaii, Digital computers.
Identifiers: Seasonal variations, Computation, Computer aided analysis.

A procedure which makes use of digital computer computational efficiency and versatility was developed to obtain best-fit electron density profiles which describe vlf propagation data. The procedure determines profiles which in some instances describe measured field strength levels very well. In cases in which the best-fit profile error proved to be large, it is probable that smaller errors would be found for computations based on profile shapes not included. As field strength levels are computed as a function of frequency for various other trial profiles, they may be added to the results obtained to date. A completed data bank of this form should be of significant use in determining the electron density profiles characteristic of the ionosphere for propagation measurements made during various seasons over the Hawaii-Southern California path. The same procedure can also be used to interpret vlf propagation data obtained over other horizongally homogeneous propagation paths. (Author)

AD-757 343 PC$3.00/MF$0.95
Naval Electronics Lab Center San Diego Calif
A PREDICTION SCHEME FOR THE LOWEST OBSERVED FREQUENCY (LOF) OF THE GUAM-NORTH WEST CAPE HF PROPAGATION PATH AND EIGHT OTHER PACIFIC PATHS.
Research and development rept. Oct 70-Oct 72,
Max P. Bleiweiss. 6 Dec 72, 28p Rept no. NELC-TR-1851

Descriptors: (*Radio transmission, High frequency), Pacific Ocean Islands, California, Curve fitting, Graphics, Periodic variations, Nomographs, Solar disturbances.

A simple method for predicting the lowest observed frequency (LOF) of hf propagation paths - LOF proportional to (cos chi (sup 1/4), where chi is solar zenith angle - is presented. Predicted values of LOF in every case examined between midpath zenith angles of 5 and 85 are found to fall within the range of two standard deviations around the mean observed LOF. These findings - for the Guam to North West Cape (NWC), Australia, propagation path - are observed to match the results of a previous report on the Hawaii to California path. Predictions of the lowest useable frequency (LUF) provided by CNO are also compared with mean observed LOF values for the Guam-NWC path. Agreement is found to be good,

though there are several exceptions. In addition, predictions are made for several other Pacific propagation paths. These are determined to fit the observed data well, with only one case of marked disagreement. It is concluded that the LOF prediction scheme is at least as good as the CNO LUF scheme, and less costly. (Author)

AD-757 482 PC$3.00/MF$0.95
Rhode Island Univ Kingston Dept of Electrical Engineering
DETECTION AND PROCESSING OF ELE (3-30 HZ) NATURAL ELECTROMAGNETIC NOISE.
Final rept. (Part 1) 16 Nov 69-15 Nov 72,
Thomas J. Keefe, Hellmuth Etzold, and Charles Polk. 15 Jan 73, 91p Rept no. 4255/1 AFCRL-TR-73-0077
Contract F19628-70-C-0090

Descriptors: (*Radiofrequency interference, Extremely low frequency), (*Magnetic recording systems, Radiofrequency interference), (*Ionospheric disturbances, Extremely low frequency), Antennas, Coils, Sensors, Instrumentation, Magnetometers, Atmospherics.
Identifiers: Schumann resonances, *Natural radiofrequency interference.

Equipment is described which permits the continuous recording of natural electromagnetic noise in the 3 Hz to 30 Hz frequency band. Sensors for two orthogonal components of the horizontal magnetic field are two meter diameter, 44000 turn air-core coils. The vertical electric field is detected either by a whip antenna or by an insulated metallic sphere located approximately ten meters above ground level. D.C. operated preamplifiers are located at the sensors, and the amplified signal is transferred 600 feet to a building where it is further amplified, filtered and direct recorded continuously on magnetic tape. (Author Modified Abstract)

AD-757 491 PC$3.00/MF$0.95
Air Force Cambridge Research Labs L G Hanscom Field Mass
PROPAGATION OF ELECTROMAGNETIC WAVES THROUGH TURBULENT MEDIA USING TRANSPORT THEORY.
Physical science research papers,
Ronald L. Fante. 18 Dec 72, 50p Rept nos. AFCRL-72-0733, AFCRL-psrp-519

Descriptors: (*Electromagnetic waves, Plasma medium), Turbulence, Clear air turbulence, Lasers, Electron density, Blackout (Electromagnetic), Ionospheric propagation, Differential equations, Numerical analysis, Reentry vehicles, Atmosphere entry.
Identifiers: Electromagnetic scattering, Laser beams, Atmospheric attentuation, Transport theory.

Transport methods have been employed to study the propagation of a narrow-angle electromagnetic beam through a turbulent medium. Results are presented for the mean-square angular divergence of the beam, cross section of the beam, and the power received by a planar aperture in the medium. The problem of back-scattered radiation is also considered and results are obtained which reduce, in the limit of zero true absorption, to previous results. (Author)

AD-757 498 PC$3.00/MF$0.95
National Committee for Space Research Haifa (Israel) Radio Observatory
IONOSPHERIC RESEARCH USING SATELLITES.
Final scientific rept. 1 Feb 69-31 Dec 71,
Jonathan Mass, Israel Keroub, and Abraham Shuval. Feb 72, 70p AFCRL-TR-73-0019
Contract F61052-69-C-0017

Descriptors: (*Ionospheric propagation, Radio waves), Navigation satellites, Radio transmission, High frequency, Polarization, Rotation, Electron density, Errors, Israel.
Identifiers: Ray tracing, Faraday effect.

The report completes two Annual Scientific Reports (1969, 1970) on the study of the ionosphere using satellites. The ray tracing program used to study ionospheric effects on satellite signals is described in some detail and examples given. The accuracy of graphical methods usually used was found to be better than 7% in a difficult case and the results were not very sensitive to the medium altitude used. A method to detect the satellite's spin for the correction of Faraday data was developed. It is based on accurately determining the changes in the polarization parameters, using the Poincare sphere concept. The contribution of the TEC (Total Electron Content) and its gradients to errors in a satellite navigation system (NNSS) were determined. These depend on the geometry of the pass relative to the station. Computed results are shown graphically and the results are interpreted. (Author)

AD-757 676 PC$3.00/MF$0.95
Naval Electronics Lab Center San Diego Calif
USE OF NELC ANTENNA MODEL RANGE FOR MEASUREMENT OF RADIATION PATTERNS AT VHF/UHF: GROUND PLANE EFFECTS AND SYSTEM/EQUIPMENT REQUIREMENTS ARE DETERMINED IN EFFORT CAPABILITY TO VHF/UHF AT 1/48 SCALE.
Rept. for Jan-Aug 72,
R. Beyer, R. L. Goodbody, and H. K. Landskov. 24 Jan 73, 31p Rept no. NELC-TR-1858

Descriptors: (*Antenna radiation patterns, *Ranges (Establishments)), Very high frequency, Ultrahigh frequency, Radiofrequency power, Efficiency, Ground (Electrical), Ship antennas.

More value could be derived from the NELC antenna model range if the frequency range could be extended from the present 96MNz-4GHz to 4-24GHz. Antenna location and intercoupling problems could then be solved through vhf and uhf. In the initial effort toward achieving this capability it is found that measurements can be made with existing equipment only if the model antenna transmits and the arch antenna receives. The report determines (1) ground plane effects, (2) system power and efficiency requirements, and (3) equipment requirements for full capability at the desired frequency range. (Author)

N73-16126 PC$8.25/MF$0.95
Stanford Univ., Calif. Radioscience Lab.
ELF PROPAGATION IN THE PLASMASPHERE BASED ON SATELLITE OBSERVATIONS OF DISCRETE AND CONTINUOUS FORMS.
J. L. Muzzio. Dec 71, 124p NASA-CR-130351, TR-3439-2
Contracts NAS5-3093, NGR-05-020-288

Descriptors: *Electromagnetic wave transmission, *Extremely low frequencies, *Hiss, *Ogo-d, *Whistlers, Electromagnetic interference, Electromagnetic noise measurement, Ionospheric noise, Radio frequency interference, Upper atmosphere.

For abstract, see STAR 11 07.

PB-215 819/4 PC$3.00/MF$0.95
Acta Polytechnica Scandinavica, Stockholm (Sweden).
WAVE NORMAL AND RAY PROPAGATION IN LOSSLESS POSITIVE BIANISOTROPIC MEDIA.
Ismo V. Lindell. 1972, 24p APS-EL-31
Pub. by the Finnish Academy of Technical Sciences, Helsinki. International Standard Book no. 951-666-008-8.
Also available from: The Finnish Academy of Technical Sciences, Lonnrotinkatu 37, 00180 Helsinki 18 (Finland) Fmk. 800.

Descriptors: (*Electromagnetic scattering, Ray tracing), Maxwells equations, Vector analysis, Partial differential equations, Matrices (Mathematics), Numerical analysis, Sweden.

Wave normal and ray propagation associated with a propagating electromagnetic discontinuity in lossless positive bianisotropic media are considered. First, conditions for a lossless bianisotropic medium that has a positive definite energy funtions (lossless positive medium) are derived. Wave normal and ray equations, which are of the fourth degree, are also derived, and the duality of the equations is discussed. Solutions of a special bianisotropic medium are considered. It is proved that for a general lossless positive bianisotropic medium there always exist two characteristic wave normal and ray surfaces. Transformation formulas for the constitutive dyadics of a moving bianisotropic medium are derived. It is proved that if a lossless positive bianisotropic medium is set in uniform motion, the medium is lossless positive if and only if the velocity is smaller than the smallest characteristic ray and wave normal velocities. (Author)

TT-72-50043 PC$3.00/MF$0.95
National Oceanic and Atmospheric Administration, Rockville, Md.
PROBLEMS OF WAVE PROPAGATION AND DIFFRACTION, NUMBER 10,
E. M. Gyunninen. 1973, 156p
Trans. from Problemy Diffraktsii i Rasprostraneniya Voln (USSR) m10 183p. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Ionospheric propagation, Diffraction), Tropospheric propagation, Waveguides, Plasmas (Physics), Very low frequencies, Airy function, Atmospherics, Mathematical models, Translations, USSR.

Contents:
- Main laws of propagation of VLF signals in the earth-ionosphere waveguide;
- Eddy currents and dipole radiation;
- Tropospheric refraction of radio waves;
- The inverse problem for an impedance sphere;
- Refinement of Booker's equation for cylindrical stratified anisotropic media;
- Scatter of waves on a thin plasma cylinder-electric field with component along the inhomogeneity gradient;
- A mathematical model of the earth's atmospherics;
- Method of electrospectroscopic investigations in the range of infralow frequencies;
- Electric parameters of a moist soil model in the range of infralow radio frequencies;
- Applicability of Airy functions to the problem of the determination of the eigenfunctions of a spherical waveguide.

21. PROPULSION AND FUELS

21B. Combustion and Ignition

AD-757 227 PC$3.00/MF$0.95
Instituto Nacional de Tecnica Aeroespacial Madrid (Spain)
DROPLET COMBUSTION AT HIGH PRESSURES WITH UNSTEADY EFFECTS.
Final rept. 1 Jun 69-31 May 72,
Carlos Sanchez Tarifa, and Antonio Crespo. 20 Dec 72, 80p AFOSR-TR-73-0433
Contract F61052-69-C-0035

Descriptors: (*Fuel sprays, Combustion), Combustion chambers, Drops, Burning rate, Combustion products, Vaporization, Flames, Approximation (Mathematics).
Identifiers: Combustion stability.

To describe subcritical combustion, there are quasisteady theories based on the fact that the ratio of

gas density to liquid density, epsilon, is small. At large pressures below critical, epsilon is not too small and unsteady effects become more important. It is found that, far from the droplet, at distances of the order of the droplet radius divided by the square root of epsilon, there is a unsteady region that originates corrections to mass burning rates, given by quasisteady theories, of order square root of epsilon. For most hydrocarbons burning in air the flame is located far from the droplet, and its position is not given, even in first approximation, by quasisteady theories. Unsteady effects are also analyzed for forced convection burning with Peclet numbers of order square root of epsilon. (Author Modified Abstract)

AD-757 234 PC$3.00/MF$0.95
Utah Univ Salt Lake City Dept of Chemical Engineering
COMBUSTION TRANSIENTS OF SOLID PROPELLANTS.
Final rept.,
Norman W. Ryan, and Alva D. Baer. 28 Feb 73, 70p AFOSR-TR-73-0437
Grant AF-AFOSR-1656-69

Descriptors: (*Solid rocket propellants, *Combustion), Ignition, Composite propellants, Ammonium perchlorate, Deflagration, Burning rate, Thermal radiation, Experimental data.
Identifiers: Combustion stability, T burners, Acoustic combustion, Extinguishment.

The report is largely a restatement of conclusions, with reference to previous publications for details. The areas of study reported are an evaluation of the hot-wire-ignition method for characterizing propellants; the development and study of a gas-fueled analog of the solid-propellant T-burner; a study of low frequency (L*) combustion of L* during a test; a study of high frequency acoustic instability of solid propellants, both a T-burner and a radial-mode, radial-flow burner being used with the same propellants systems; the development and evaluation of a technique for measuring the solid-propellant response function to external energy perturbations at the burning surface; the measurement and evaluation of transient temperatures of propellant flames during rapid depressurization; and a detailed characterization of the low-pressure-combustion phenomena for several different solid propellants including studies of the low-pressure deflagration limit, the electrical conductance near the surface, the extinguishment requirements, and spontaneous reignition. (Author Modified Abstract)

AD-757 298 Reprint
Arizona Univ Tucson Inst of Atmospheric Physics
THE OPTICAL TEMPERATURE OF THE APOLLO 15 EXHAUST PLUME,
A. E. Pifer, and E. P. Krider. 16 Jun 72, 1p Rept no. Reprint-298
Contract N00014-67-A-0209-0012
Availability: Pub. in Jnl. of Spacecraft and Rockets, v9 n11 p847-848 Nov 72.

Descriptors: (*Exhaust flames, Thermal radiation), (*Launch vehicles (Aerospace), *Rocket motors (Liquid propellant)), Rocket motor nozzles, Radiation pyrometers, Launching sites, Temperature, Manned spacecraft.
Identifiers: Rocket exhaust, *Plume detection, Saturn 5 launch vehicles.

During the launch of Apollo 15, an optical pyrometer was used to estimate the peak plume temperature of the Saturn V first stage exhaust. The purpose of this experiment was to obtain a temperature in the visible region of the spectrum which, when combined with other measurements in the infrared, would provide data for a theoretical model of the exhaust plume conductivity during a launch. (Author)

AD-757 347 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
AMMONIUM PERCHLORATE AND AMMONIUM PERCHLORATE - BINDER SANDWICH COMBUSTION.
Technical rept.,
J. L. Murphy, and D. W. Netzer. 1 Feb 73, 45p
Rept no. NPS-57Nt73021A

Descriptors: (*Ammonium perchlorate, *Combustion), (*Deflagration, Ammonium perchlorate), (*Solid rocket propellants, Ammonium perchlorate), Binders, Schlieren photography, High-speed photography, Binders, Pressure, Impurities, Burning rate.

Single crystal and pressed polycrystalline ammonium perchlorate (AP) wafers, pressed polycrystalline AP pellets, and ammonium perchlorate-binder (polybutadiene acrylic acid, hydroxyl terminated polybutadiene, polyurethane, and carboxyl terminated polybutadiene) sandwiches were burned in a schlieren equipped combustion bomb and in a centrifuge mounted combustion bomb. High-speed color schlieren and regular motion pictures were taken of the combustion process to determine the effects of pressure, binder type, binder thickness, and purity of ammonium perchlorate on the AP deflagration. AP pellet fabrication techniques and burning rate acceleration sensitivity were also investigated. (Author)

AD-757 612 PC$3.00/MF$0.95
Edgewood Arsenal Md
THERMOCOUPLE MEASUREMENT OF HEAT FLUX AND APPLICATION TO IGNITION OF WOOD.
Technical rept. Jun-Aug 71,
C. Stuart Kelley, and Aldean Benge. Mar 73, 41p
Rept no. EA-TR-4696

Descriptors: (*Wood, *Ignition), (*Heat flux, Measurement), Thermocouples, Theory, Numerical analysis, Predictions.

Measurements reported here on flames from thickened hydrocarbons indicate that close to, but outside, the flame outline the thermocouple temperature can be converted to the heat flux emitted by the flame. From the thermocouple data, the dependence of the time to ignition for a wood target outside the flame on the angle from the flame symmetry axis is established. For angles less than about 10 degrees, the ignition time is relatively constant; for larger angles, it increases rapidly. The dependence of the time to ignition on the height above the flame agent is also established; it incrases rapidly with increasing height. Measurements reported here on the ignition of wood confirm the predicted dependence of the ignition time on the time-dependent of the ignition time on the time-dependent incident heat flux intensity. (Author)

N73-16928 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
RATE OF REACTION BETWEEN MOLECULAR HYDROGEN AND MOLECULAR OXYGEN.
R. S. Brokaw. Feb 73, 11p NASA-TM-X-2707, E-7195

Descriptors: *Ignition, *Molecular gases, *Reaction kinetics, *Shock tubes, Combustion, Endothermic fuels, Hydrogen, Initiation, Intake systems, Oxygen.

For abstract, see STAR 11 07.

N73-16929 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
HIGH-PRESSURE COMBUSTOR EXHAUST EMISSIONS WITH IMPROVED AIR-ATOMIZING AND CONVENTIONAL PRESSURE-ATOMIZING FUEL NOZZLES.
R. D. Ingebo, and C. T. Norgren. Feb 73, 24p
NASA-TN-D-7154, E-7148

Descriptors: *Combustion chambers, *Exhaust gases, *Fuel injection, *Nozzle efficiency, Air pollution, Combustion physics, Hydrocarbons, Nitric oxide, Performance tests, Turbojet engines.

For abstract, see STAR 11 07.

N73-16930 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SIMULTANEOUS FILM AND CONVECTION COOLING OF A PLATE INSERTED IN THE EXHAUST STREAM OF A GAS TURBINE COMBUSTOR.
C. J. Marek, and A. J. Juhasz. Feb 73, 37p
NASA-TN-D-7156, E-7165

Descriptors: *Combustion chambers, *Convective heat transfer, *Film cooling, *Gas turbines, Flat plates, Linings, Thermocouples, Turbulent mixing, Wall temperature.

For abstract, see STAR 11 07.

N73-16933 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
HYDROGEN AND HYDROCARBON DIFFUSION FLAMES IN A WEIGHTLESS ENVIRONMENT.
J. B. Haggard, Jr., and T. H. Cochran. Feb 73, 30p
NASA-TN-D-7165, E-6687

Descriptors: *Combustion physics, *Flame propagation, *Flammable gases, *Weightlessness, Air flow, Ethylene, Hydrogen, Laminar flow, Propylene.

For abstract, see STAR 11 07.

N73-16934 PC$3.00/MF$0.95
Kanner (Leo)Associates, Redwood City, Calif.
AERODYNAMICS OF LAMINAR DIFFUSIVE FLAMES.
L. P. Yarin. Feb 73, 17p NASA-TT-F-14688
Contract NASW-2481
Tran- Transl. Into English From Fiz. Goreniya Vzryva (Novosibirsk), V. 7, Sep. 1971 P 395-404

Descriptors: *Aerodynamic characteristics, *Flames, *Gas jets, *Laminar flow, *Slipstreams, Burning rate, Diffusion, Gas flow, Temperature gradients.

For abstract, see STAR 11 07.

21C. Electric Propulsion

N73-16774 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EXPERIMENTAL INVESTIGATION OF A 2.5 CENTIMETER DIAMETER KAUFMAN MICROTHRUSTER.
A. J. Cohen. Feb 73, 23p NASA-TM-X-2708, E-7127

Descriptors: *Electron bombardment, *Microthrust, *Performance tests, Cathodes, Electric rocket engines, Sert 2 spacecraft.

For abstract, see STAR 11 07.

N73-16777 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
A 5000-HOUR TEST OF A GRID-TRANSLATION BEAM-DEFLECTION SYSTEM FOR A 5-CM DIAMETER KAUFMAN THRUSTER.
W. C. Lathem. 15 Jan 73, 18p NASA-TM-X-68185, E-7301

Descriptors: *Ion propulsion, *Performance tests, *Rocket engines, Grids, Mercury (metal), Sert 2 spacecraft, Service life.

For abstract, see STAR 11 07.

21D. Fuels

AD-757 463 Not available NTIS
Deutsche Versuchsanstalt Fuer Luft-Und Raumfahrt E V Munich (West Germany)
UEBER DAS BRENNVERHALTEN VON KRAFTSTOFFEN FUER LUFTATMENDE TRIEBWERKE (BURNING CHARACTERISTICS OF FUELS FOR AIR BREATHING JET ENGINES),
Guenter Spengler, and Hans Gemperlein. 1963, 29p DVL-295
Text in German.
Availability: Pub. in Erdoel und Kohle. Erdgas. Petrochemie, v16 p570-577 1963.

Descriptors: (*Jet engine fuels, Combustion), (*Ramjet engines, Jet engine fuels), Burning rate, Fuel additives, Thrust, Combustion products, Chemical analysis, West Germany.

The report deals with the relations between the chemical constitution of fuels and the burning characteristics by means of the thrust, the rate of combustion and some radicals occurring during combustion and being analysed with the help of the emission-analysis. Furthermore, the possibility to influence the combustion process by fuel additives is stressed. Various examples are given. (Author)

N73-16771 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
COMPARISON OF COMBUSTION CHARACTERISTICS OF ASTM A-1, PROPANE, AND NATURAL-GAS FUELS IN AN ANNULAR TURBOJET COMBUSTOR.
J. D. Wear, and R. E. Jones. Jan 73, 23p
NASA-TN-D-7135, E-7078

Descriptors: *Combustion efficiency, *Fuel tests, *Turbojet engines, Annular flow, Inlet nozzles, Natural gas, Propane, Supersonic flight, Systems analysis.

For abstract, see STAR 11 07.

21E. Jet and Gas Turbine Engines

AD-757 162 PC$3.00/MF$0.95
Cincinnati Univ Ohio Dept of Aerospace Engineering
CALCULATION OF THE THREE DIMENSIONAL PARTICLE TRAJECTORIES IN A ONE AND ONE-HALF STAGE OF A COMPRESSOR.
Technical rept.,
M. Fathy Hussein, and W. Tabakoff. Feb 73, 94p
Rept no. 73-34 AROD-T-4:54-E
Contract DAHC04-69-C-0016

Descriptors: (*Guide vanes, Particle trajectories), (*Gas turbines, Compressor blades), Two-phase flow, Flow fields, Particles, Equations of motion, Erosion, Compressor rotors.
Identifiers: Computer aided analysis.

The equations of motion, in three dimensions, for solid particles moving in a compressible gas flow in a rotating cascade are solved for the case of the particles moving through a compressor guide vane followed by a compressor stage. The solution considers the particle impact and rebound with both the blade walls and the compressor casing. The three dimensional absolute paths of the particles, their trajectories relative to the compressor rotor, their velocity histories, and the combined particle velocity diagrams in the compressor cascades are given. The effects of flow parameters on the dynamic behavior of the solid particles throughout the compressor one and one-half stage are investigated. (Author Modified Abstract)

AD-757 173 PC$3.00/MF$0.95
Airesearch Mfg Co of Arizona Phoenix
ADVANCED, SMALL, HIGH-TEMPERATURE RISE COMBUSTOR PROGRAM.
Semiannual progress rept. 1 Apr-30 Sep 72,
Michael P. Wood. 25 Oct 72, 155p Rept no. PE-8120-R27
Contract DAAJ02-70-C-0060

Descriptors: (*Combustion chambers, Design), (*Gas turbines, Combustion chambers), Two-dimensional flow, Cold flow tests, Combustion, Air cooled, Fuel nozzles, Fuel injection, Fuel sprays, Combustion chamber liners, Mathematical models.
Identifiers: Turboshaft engines.

The report is a semi-annual progress report of an analytical and experimental study addressed to the problems associated with advanced, small, high temperature-rise combustors. This report summarizes work conducted during the period of April 1, 1972, to September 30, 1972. The program, initiated in June 1970, is divided into three phases, as follows: Phase I - element analysis, Phase II - conceptual design, element testing, design evaluation, and concept selection, and Phase III - combustor final design, fabrication, and testing. The report summarizes the activities during the six-month period from April 1, 1972 to September 30, 1972, during which time Phase II activities were completed and the Phase III test plan and test equipment were defined. (Author Modified Abstract)

AD-757 217 PC$3.00/MF$0.95
Von Karman Inst for Fluid Dynamics Rhode-Saint-Genese (Belgium) Turbomachinery Lab
THE LOW HUB-TIP RATIO SUPERSONIC AXIAL-FLOW COMPRESSOR. VOLUME II.
Final rept. 1 Jul 71-30 Jun 72,
Frans A. E. Breugelmans. Nov 72, 72p Rept no. VKI-IN-41 ARL-73-0057
Grant AF-AFOSR-2104-71
See also report dated Jun 72, AD-752 585.

Descriptors: (*Axial-flow compressors, Stalling), Inlet guide vanes, Compressor rotors, Compressor stators, Supersonic flow, Flow fields, Cascade structures, Pressure, Performance (Engineering).
Identifiers: Supersonic compressors.

The report describes the test results of a supersonic axial-flow compressor stage with a tip Mach number of 2.0. This volume discusses a method to eliminate the inlet problem. (Author)

AD-757 250 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
EXPERIMENTAL DETERMINATION OF TURNING ANGLE AND LOSSES OF AXIAL COMPRESSOR INLET GUIDE VANES.
Master's thesis,
William Richard Wheeler. Dec 72, 47p

Descriptors: (*Cascade structures, Efficiency), (*Axial-flow compressors, Inlet guide vanes), Flow fields, Gas turbines, Axial-flow compressor blades, Boundary layer control, Wake, Camber, Mathematical models, Theses.
Identifiers: Computer aided analysis, Design criteria.

The investigation experimentally determined the minimum loss incidence angle, deviation angle, and total-pressure loss coefficient for a cascade with airfoil-type blade profiles used as inlet guide vanes for an axial-flow compressor with an equivalent camber angle of 37.6 degrees and unit solidity. The experimental values were compared with values predicted using correlations based on compressor cascade tests. (Author)

AD-757 255 PC$3.00/MF$0.95
Naval Postgraduate School Monterey Calif
A THEORETICAL ANALYSIS OF UNSTEADY TRANSONIC CASCADE FLOW.
Engineer's thesis,
Philip Robert Elder. Dec 72, 162p

Descriptors: (*Turbine blades, Flutter), (*Jet engines, Cascade structures), Transonic flow, Aeroelasticity, Stability, Oscillation, Airfoils, Mathematical models, Computer programs, Integral transforms, Theses.

The report presents an analysis of transonic potential flow through an oscillating unstaggered thin plate cascade. A collection technique is used involving the superposition of adjacent blade 'isolated foil' potentials with interference potentials of unknown strength. Imposition of flow tangency requirements leads to integral equations for the unknown source distributions of the interference potentials. Results presented include the interference coefficients for the steady and oscillating cases. The steady case is extended to the determination of the potentials along the blade and compares favorably with a parellel solution using a Laplace transform approach to the sonic wind tunnel wall interference problem. (Author)

N73-16251 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CONTROL OF EXIT VELOCITY PROFILE OF AN ASYMMETRIC ANNULAR DIFFUSER USING WALL SUCTION.
A. J. Juhasz. Feb 73, 23p NASA-TM-X-2710, E-7169

Descriptors: *Combustion chambers, *Exhaust diffusers, *Flow characteristics, *Gas turbines, Boundary layers, Numerical analysis, Pressure distribution, Wall pressure.

For abstract, see STAR 11 07.

N73-16770 PC$3.00/MF$0.95
General Electric Co., Cincinnati, Ohio.
EXPERIMENTAL INVESTIGATION OF A 4 1/2--STAGE TURBINE WITH VERY HIGH STAGE LOADING FACTOR. I TURBINE DESIGN.
D. C. Evans, and J. M. Hill. Jan 73, 126p
NASA-CR-2140
Contract NAS3-15322

Descriptors: *Loads (forces), *Turbines, *Turbofans, Performance prediction, Systems engineering, Vanes, Velocity distribution.

For abstract, see STAR 11 07.

N73-16773 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EXPERIMENTAL PERFORMANCE OF CASCADE THRUST REVERSERS AT FORWARD VELOCITY.
D. A. Dietrich, and R. W. Luidens. 1973, 22p
NASA-TM-X-2665, E-7125

Descriptors: *Cascade flow, *Static tests, *Thrust reversal, *Wind tunnel models, Ducted fans, Jet control, Short takeoff aircraft, Turbine blades.

For abstract, see STAR 11 07.

N73-16776 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EFFECT OF A REDUCTION IN BLADE THICKNESS ON PERFORMANCE OF A SINGLE STAGE 20.32 CENTIMETER MEAN DIAMETER TURBINE.
W. J. Nusbaum, and M. G. Kofskey. Feb 73, 26p
NASA-TN-D-7128, E-7029

Descriptors: *Engine design, *Performance tests, *Turbine blades, *Turbine engines, Air flow, En-

gine tests, Equipment specifications, Manufacturing.

For abstract, see STAR 11 07.

N73-16778 PC$3.00/MF$0.95
General Electric Co., Cincinnati, Ohio.
HIGHLY LOADED MULTI-STAGE FAN DRIVE TURBINE-CASCADE TEST PROGRAM.
D. G. Cherry, T. K. Staley, and M. W. Thomas.
Jan 73, 153p NASA-CR-2171, REPT-72AEG268
Contract NAS3-14304

Descriptors: *Cascade wind tunnels, *Turbine blades, *Turbofan engines, Aerodynamic configurations, Aerodynamic loads, Graphs (charts), Inlet flow, Static pressure.

For abstract, see STAR 11 07.

21F. Nuclear Propulsion

BNL-50362 PC$3.00/MF$0.95
Brookhaven National Lab., Upton, N. Y.
ROTATING FLUIDIZED BED REACTOR FOR SPACE NUCLEAR PROPULSION. ANNUAL REPORT- DESIGN STUDIES AND EXPERIMENTAL RESULTS, JUNE 1971-JUNE 1972.
J. M. Hendrie, K. C. Hoffman, R. J. Isler, H. Ludewig, and A. J. Manning. Sep 72, 56p

Descriptors: *Reactors/ fluid-fueled, *Reactors/ rocket.

For abstract, see NSA 27 06, number 14231.

LA-DC-72-1234 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
DESIGN OF A NUCLEAR ROCKET ENGINE FOR ADVANCED UNMANNED MISSIONS.
F. P. Durham, and W. L. Kirk. 10p CONF-721116-3
From 8. Propulsion Joint Specialists Conference-New Orleans, La (29 Nov 1972).

Descriptors: *Reactors/ rocket, *Rover reactors.

For abstract, see NSA 27 06, number 14232.

LA-DC-72-1255 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
MISSION PERFORMANCE OF A 360-MW NUCLEAR ROCKET ENGINE.
J. D. Balcomb. 1972, 7p CONF-721116-2
Contract W-7405-ENG-36
From 8. Propulsion Joint Specialists Conference-New Orleans, La (29 Nov 1972).

Descriptors: *Reactors/ rocket, *Space flight.

For abstract, see NSA 27 06, number 14233.

LA-DC-72-1262 PC$3.00/MF$0.95
Los Alamos Scientific Lab., N. Mex.
NUCLEAR ROCKET ENERGY CENTER CONCEPT.
J. H. Altseimer, and L. A. Booth. 1972, 14p CONF-721116-1
From 8. Propulsion Joint Specialists Conference-New Orleans, La (29 Nov 1972).

Descriptors: *Reactors/ rocket.

For abstract, see NSA 27 06, number 14234.

N73-16691 PC$3.00/MF$0.95
Humphreys Corp., Concord, N.H.
INDUCTION SIMULATION OF GAS CORE NUCLEAR ENGINE.
J. W. Poole, and C. E. Vogel. Feb 73, 44p
NASA-CR-2155
Contract NAS3-14416

Descriptors: *Nuclear propulsion, *Nuclear reactors, *Reactor cores, *Reactor technology, *Simulators, Equipment specifications, Gaseous rocket propellants, Induction heating, Test facilities.

For abstract, see STAR 11 07.

TID-26217 PC$3.00/MF$0.95
United Aircraft Corp., East Hartford, Conn. Research Labs.
INVESTIGATION OF GASEOUS NUCLEAR ROCKET TECHNOLOGY- SUMMARY TECHNICAL REPORT.
J. S. Kendall. Sep 72, 113p L-910905-13
Contract SNPC-70

Descriptors: *Reactors/ gas-fueled, *Reactors/ rocket.

For abstract, see NSA 27 06, number 14237.

TID-26218 PC$3.00/MF$0.95
United Aircraft Corp., East Hartford, Conn. Research Labs.
NUCLEAR LIGHT BULB PROPELLANT HEATING SIMULATION USING A TUNGSTEN/ARGON AEROSOL AND RADIATION FROM A DC ARC SURROUNDED BY A SEGMENTED MIRROR CAVITY.
J. F. Klein. Sep 72, 57p L-910900-13
Contract SNPC-70

Descriptors: *Reactors/ gas-fueled, *Reactors/ rocket.

For abstract, see NSA 27 06, number 14238.

TID-26220 PC$3.00/MF$0.95
United Aircraft Corp., East Hartford, Conn. Research Labs.
ANALYTICAL DESIGN AND PERFORMANCE STUDIES OF NUCLEAR FURNACE TESTS OF SMALL NUCLEAR LIGHT BULB MODELS.
T. S. Latham, and R. J. Rodgers. Sep 72, 87p L-910900-17
Contract SNPC-70

Descriptors: *Critical assemblies, *Reactors/ gas-fueled, *Reactors/ rocket.

For abstract, see NSA 27 06, number 14240.

TID-26222 PC$3.00/MF$0.95
United Aircraft Corp., East Hartford, Conn. Research Labs.
ANALYTICAL DESIGN AND PERFORMANCE STUDIES OF THE NUCLEAR LIGHT BULB ENGINE.
R. J. Rodgers, and T. S. Latham. Sep 72, 78p L-910900-16
Contract SNPC-70

Descriptors: *Reactors/ gas-fueled, *Reactors/ rocket.

For abstract, see NSA 27 06, number 14241.

TID-26223 PC$3.00/MF$0.95
United Aircraft Corp., East Hartford, Conn. Research Labs.
DEVELOPMENT OF RF PLASMA SIMULATIONS OF IN-REACTOR TESTS OF SMALL MODELS OF THE NUCLEAR LIGHT BULB FUEL REGION.
W. C. Roman, and J. F. Jaminet. Sep 72, 130p L-910900-12

Descriptors: *Reactors/ gas-fueled, *Reactors/ rocket.

For abstract, see NSA 27 06, number 14242.

TID-26228 PC$3.00/MF$0.95
United Aircraft Corp., East Hartford, Conn. Research Labs.
CONCEPTUAL DESIGN STUDIES AND EXPERIMENTS RELATED TO CAVITY EXHAUST SYSTEMS FOR NUCLEAR LIGHT BULB CONFIGURATIONS.
J. S. Kendall, and R. C. Stoeffler. Sep 72, 33p L-910900-15

Descriptors: *Reactors/ rocket.

For abstract, see NSA 27 06, number 14243.

21H. Rocket Motors and Engines

AD-757 272 Not available NTIS
Explosives Research and Development Establishment Waltham Abbey (England)
THE SERVICE LIFE OF ROCKET MOTORS FILLED WITH DOUBLE BASE PROPELLANTS,
G. H. S. Young. Jan 73, 10p Rept no. ERDE-Offprint-27 DRIC-BR-33548
Availability: Pub. in AIAA/SAE Joint Propulsion Specialist Conference (8th), 27 Nov-1 Dec 72. PC$2.00/MF$1.00. Paper no. 72-1109.

Descriptors: (*Double base rocket propellants, Rocket motors (Solid propellant)), (*Rocket motors (Solid propellant), Life expectancy), Double base rocket propellants, Solid rocket propellant binders, Solid rocket propellant plasticizers, Additives, Combustion, Interior ballistics, Great Britain.

Double base propellants have been used in British Service for over 70 years; originally chemical stability was assured by the addition of mineral jelly but this was later replaced by the more effective ethyl centralite. Ordnance propellants were sentenced as life expired when half the stabilizer initially present had been consumed. Life assessment has become more complex for modern compositions, especially those containing additives such as lead compounds or ammonium perchlorate, although chemical stability remains of paramount importance. With the advent of larger charges, problems of self-heating and gas generation have resulted in the development of new methods for testing chemical stability. Ballistic and physical property changes which cannot always be predicted from accelerated storage tests have also become more important for rocket applications. The interactions between double base propellants and the inhibitors and adhesives used are also life limiting. (Author Modified Abstract)

N73-16496 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
A COOLED-GAS PYROMETER FOR USE IN HYPERSONIC ENGINE TESTING.
G. E. Glawe. Feb 73, 18p NASA-TM-X-2715, E-7214

Descriptors: *Engine tests, *Hypersonic speed, *Pyrometers, *Rocket engines, *Temperature measuring instruments, Electronic equipment, Equipment specifications, Research projects, Test equipment.

For abstract, see STAR 11 07.

N73-16768 PC$3.75/MF$0.95
Boeing Co., Seattle, Wash. Aerospace Group.
HEUS-RS APPLICATIONS STUDY, VOLUME 2.
Final Report
Jun 72, 31p NASA-CR-130275, D2-116262-2-VOL-2
Contract NAS2-6518

Descriptors: *Costs, *Restartable rocket engines, Launching, Performance prediction, Titan project.

For abstract, see STAR 11 07.

N73-16769 PC$4.25/MF$0.95
Lockheed Propulsion Co., Redlands, Calif.
TECHNICAL REPORT ANALYSIS AND DESIGN STUDY OF SOLID ROCKET MOTORS FOR A SPACE SHUTTLE BOOSTER, VOLUME 2, BOOK 1, SUPPLEMENT 1.
Final Report, 13 Jan. - 15 Mar. 1972
2 May 72, 42p NASA-CR-124002,
LPC-629-6-VOL-2-BK-1-SUPPL-1
Contract NAS8-28429

Descriptors: *Solid propellant rocket engines, *Space shuttle boosters, *Systems analysis, Aborted missions, Cost effectiveness, Ecology, Space shuttles.

For abstract, see STAR 11 07.

N73-16779 PC$7.50/MF$0.95
Deutsche Forschungs- Und Versuchsanstalt Fuer Luft- Und Raumfahrt, Lampoldshausen (West Germany). Inst. Fuer Chemische Radketenantriebe.
PERFORMANCE OF COAXIAL INJECTORS IN LIQUID OXYGEN-GASEOUS HYDROGEN . LEISTUNGSVERHALTEN KOAXIALER EINSPRITZSYSTEME IN LO2/GH2-RAKETENTRIEBWERKEN.
H. J. Sternfeld. Jun 71, 106p DLR-FB-71-56
Language German English Summary

Descriptors: *Hydrogen, *Injectors, *Liquid oxygen, *Liquid propellant rocket engines, *Performance tests, Combustion chambers, Combustion stability, Combustion vibration, Concentration (composition), Gas pressure, Pressure oscillations.

For abstract, see STAR 11 07.

21I. Rocket Propellants

AD-757 066 PC$3.00/MF$0.95
Stevens Inst of Tech Hoboken N J Dept of Mechanical Engineering
EXPERIMENTAL STUDY OF THE COMPOSITE SOLID PROPELLANT DEFLAGRATION PROCESS ON A FUNDAMENTAL LEVEL.
Final rept. 1 Oct 61-15 Nov 72,
Robert F. McAlevy, III, and Richard B. Cole. Feb 73, 9p Rept no. ME-RT-72008
Contract N00014-67-A-0202-0023

Descriptors: (*Solid rocket propellants, *Deflagration), Scientific research, Pyrolysis, Ammonium perchlorate, Solid rocket propellant binders, Vaporization.

Investigations over an eleven-year period of the overall mechanism of composite solid propellant deflagration and its component processes are summarized. Experimental studies and techniques involving diagnostic measurements on analog burners (of several types) and characterizations of the linear pyrolysis of propellant ingredients (polymers and ammonium perchlorate) are included along with efforts at modeling the overall mechanism. All publications resulting from the work reported are cited. (Author)

AD-757 245 PC$3.00/MF$0.95
Frost (Edward R) and Associates Newport Beach Calif
DESIGN OF MICROFILM ACQUISITION, STORAGE AND RETRIEVAL SYSTEM FOR SOLID PROPELLANT MECHANICAL BEHAVIOR DATA.
Final rept. 15 Feb-10 Apr 72,
Edward R. Frost. 10 Apr 72, 57p AFRPL-TR-72-40
Contract F04611-72-C-0016

Descriptors: (*Information retrieval, Solid rocket propellants), (*Data storage systems, Microfilm), (*Solid rocket propellants, Mechanical properties), Design, Microfiche, Microphotography, Subject indexing, Film readers, Data processing systems.

The report contains the results of a microfilm system design and update which have as its primary objective the establishment of a standardized microfilm system for acquisition, storage and retrieval of raw physical properties data generated during solid propellant research and development programs. The proposed system was designed to be economical, convenient and non-burdensome with a simplified automated tabulating system to facilitate data handling. Some factors taken into consideration before arriving at the final design were state-of-the-art, availability of equipment, availability of service bureaus, indexing requirements, incidence of retrieval, physical characteristics of raw data formats, techniques for comparative analysis, data exchange requirements, and interrelated data requirements. (Author Modified Abstract)

PATENT-3708359
Not Available - NTIS
Rocketdyne, Canoga Park, Calif.
HYDRAZINIUM NITROFORMATE PROPELLANT WITH SATURATED POLYMERIC HYDROCARBON BINDER.
Patent
V. E. Haury. Patented 2 Jan 73, 4p
NASA-CASE-NPO-12015
Field 23 Sep. 1970 Supersedes N71-33856 (09 - 20, P 3338)
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: Patents, *Solid rocket propellants, Solid rocket oxidizers, Solid rocket binders, Solid rocket curing agents.
Identifiers: PAT.CL. 149-19.

A solid propellant composition is reported that contain hydrazinium nitroformate as an oxidizer, a saturated polymeric hydrocation binder and a polyisocyanate as curing agent to prevent deterioration of the propellant.

N73-16765 PC$4.00/MF$0.95
SHUTTLE REACTION CONTROL SYSTEM. CRYOGENIC LIQUID DISTRIBUTION SYSTEM STUDY.
J. W. Akkerman. Jan 72, 36p NASA-TM-X-68913, MSC-06737

Descriptors: *Cryogenic rocket propellants, *Reaction control, *Space shuttles, Cryogenic fluid storage, Systems engineering, Thermodynamics.

For abstract, see STAR 11 07.

N73-16775 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
EVALUATION OF MAGNESIUM-ALUMINUM EUTECTIC TO IMPROVE COMBUSTION EFFICIENCY IN LOW BURNING RATE PROPELLANTS.
B. G. Northam, and E. M. Sullivan. Feb 73, 13p
NASA-TN-D-7133, L-8546

Descriptors: *Aluminum coatings, *Combustion efficiency, *Solid rocket propellants, Burning rate, Magnesium alloys, Photomicrographs, Propellant grains, Test firing.

For abstract, see STAR 11 07.

N73-16780 PC$4.50/MF$0.95
Deutsche Forschungs- Und Versuchsanstalt Fuer Luft- Und Raumfahrt, Lampoldshausen (West Germany). Inst. Fuer Chemische Raketenantriebe.
INVESTIGATION OF VARIOUS GRAIN CONFIGURATIONS CONCERNING POLYETHYLENE/FLOX-70 HYBRID ENGINE. PART 2 EXPERIMENTAL PERFORMANCE . UNTERSUCHUNG VERSCHIEDENER BRENNRAUMGEOMETRIEN FUER EIN POLYAETHYLEN/FLOX-70-TRIEBWERK. TEIL 2 LEISTUNGSVERHALTEN.
H. Weiler, and R. Buchheim. May 72, 46p
DLR-FB-72-61
Language German English Summary

Descriptors: *Flox, *Hybrid propellant rocket engines, *Propellant grains, *Propulsion system performance, Combustion efficiency, Geometry, Polyethylenes, Specific impulse.

For abstract, see STAR 11 07.

22. SPACE TECHNOLOGY

22A. Astronautics

AD-757 392 PC$3.00/MF$0.95
Army Engineer Waterways Experiment Station Vicksburg Miss
OPERATIONS AND MAINTENANCE MANUAL FOR A SCALE-MODEL LUNAR ROVING VEHICLE.
Final rept.,
Allen S. Lessem. Apr 72, 62p Rept no. AEWES-Misc-Paper-M-72-3

Descriptors: (*Models (Simulations), Maintenance), (*Lunar surface vehicles, *Extravehicular activity), Mobility, Configuration, Instrumentation, Telemetering data, Instruction manuals, Calibration, Lunar environment, Simulation.
Identifiers: Lunar roving vehicles, Apollo, Apollo 15 spacecraft.

A one-sixth scale model of the Lunar Roving Vehicle used in the Apollo 15 mission was built and instrumented to conduct model studies of vehicle mobility. The model was free running under radio control and was equipped with a lightweight telemetry transmitter that allowed 16 channels of data to be gathered simultaneously. String payout and fifth-wheel devices were developed to measure vehicle velocity. Other real-time measurements included wheel torque, wheel speed, center-of-gravity accelerations, and steering forces. Calibration, operations, and maintenance procedures were worked out. Details of the development of the instrumentation, its maintenance, some of the problems encountered etc., are recorded in this report to serve as a preliminary operations and maintenance manual for this specific model. (Author)

N73-16592 PC$3.50/MF$0.95
Brown Univ., Providence, R.I. Center for Dynamical Systems.
PERTURBED NONLINEAR DIFFERENTIAL EQUATIONS.
T. G. Proctor. 1972, 26p NASA-CR-130277
Contract NGL-40-002-015

Descriptors: *Differential equations, *Perturbation theory, Integral equations, Manifolds (mathematics), Nonlinear equations.

For abstract, see STAR 11 07.

N73-16815 PC$3.75/MF$0.95
Aerospace Corp., El Segundo, Calif. Systems Planning Div.
ANALYSIS OF SPACE TUG OPERATING TECHNIQUES (STUDY 2.4). VOLUME 1 EXECUTIVE SUMMARY.
Aug 72, 35p NASA-CR-130366, ATR-73 (7314)-1-VOL-1
Contract NASW-2301

Descriptors: *Costs, *Reusable spacecraft, *Space tugs, Payloads, Space maintenance, Systems analysis.

For abstract, see STAR 11 07.

N73-16828 PC$3.25/MF$0.95
Scientific Translation Service, Santa Barbara, Calif.
NEW INVESTIGATIONS OF THE OPTIMUM RENDEZVOUS MANEUVER OF SPACE VEHICLES ON ELLIPTICAL TRAJECTORIES FOR MINIMUM FUEL CONSUMPTION.
A. Marinescu, S. Staicu, and V. Cardos. Jan 73, 24p NASA-TT-F-14644
Contract NASW-2483
Tran- Transl. Into English From Z. Flugwiss (Germany), V. 20, Apr. 1972 P 146-154

Descriptors: *Fuel consumption, *Rendezvous trajectories, *Trajectory optimization, Acceleration (physics), Elliptical orbits, Orbital mechanics, Thrust.

For abstract, see STAR 11 07.

N73-16835 PC$5.50/MF$0.95
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
SPACE PROGRAM PAYLOAD COSTS AND THEIR POSSIBLE REDUCTION.
E. M. Vanvleck, J. M. Deerwebster, S. M. Norman, and L. R. Alton. Jan 73, 68p
NASA-TM-X-62223

Descriptors: *Cost reduction, *Payloads, *Space programs, Economy, Management planning, Manned spacecraft, Technology utilization, Unmanned spacecraft.

For abstract, see STAR 11 07.

N73-16836 PC$8.75/MF$0.95
General Electric Co., Philadelphia, Pa. Valley Forge Space Center.
LUNAR LIBRATION POINT FLIGHT DYNAMICS STUDY.
Final Report, May - Nov. 1968
Apr 69, 132p NASA-CR-130135
Contract NAS5-11551

Descriptors: *Communication satellites, *Lunar far side, *Satellite orbits, *Space communication, Data links, Libration, Satellite attitude control, Satellite design.

For abstract, see STAR 11 07.

N73-16838 PC$3.00/MF$0.95
National Aeronautics and Space Administration, Washington, D.C.
THE PROBLEM OF SPACE VEHICLE DESCENT IN PLANETARY ATMOSPHERES.
N. M. Ivanov, and A. I. Martynov. Feb 73, 51p
NASA-TT-F-768
Tran- Transl. Into English of the Book Problemaspuska Kosmicheskikh Apparatov V Atmosferakh Planet Moscow, Znaniye Press, 1972 P 5-47

Descriptors: *Descent trajectories, *Jupiter atmosphere, *Mars atmosphere, *Spacecraft, *Venus atmosphere, Atmospheric entry, Physical properties, Planetary composition, Planetary temperature, Problem solving.

For abstract, see STAR 11 07.

N73-16907 PC$3.00/MF$0.95
Structures Research Associates, Laguna Beach, Calif.
THE EFFECT OF ANGLE OF ATTACH ON THE BUCKLING OF MARS ENTRY AEROSHELLS.
G. A. Cohen. Feb 73, 21p NASA-CR-2087
Contract NAS1-10091

Descriptors: *Aerospace vehicles, *Angle of attack, *Dynamic structural analysis, *Mars (planet), *Pressure distribution, *Reentry vehicles, Buckling, Conical bodies, Deformation, Mechanical properties, Stress analysis.

For abstract, see STAR 11 07.

22B. Spacecraft

AD-757 681 PC$3.00/MF$0.95
Stanford Univ Calif Inst for Plasma Research
SCIENTIFIC EXPLORATION WITH AN OUT-OF-ECLIPTIC SPACECRAFT,
John M. Wilcox. Feb 73, 23p Rept no. SU-IPR-504
Contract N00014-67-A-0112-0068, Grant NGR-05-020-559
Sponsored in part by Grant NSF-GA-31138.

Descriptors: (*Space probes, Mission profiles), (*Space environmental conditions, Scientific research), (*Sun, Space probes), Solar flares, Sunspots, Periodic variations, Magnetic fields, Solar wind, Cosmic rays, Scientific satellites.
Identifiers: Out of ecliptic spacecraft, Interplanetary magnetic fields, Solar magnetic fields, Galactic cosmic rays.

The scientific objectives for an out-of-ecliptic spacecraft mission are reviewed. Much has been learned that was new and unexpected by observing the equatorial regions of the solar wind. It may be anticipated that equally surprising and new understanding will result from an out-of-ecliptic mission. Possible areas of research which will benefit from such a mission include: solar wind, solar magnetic field, solar corona, galactic cosmic rays. (Author)

AD-757 424 PC$3.00/MF$0.95
Grumman Aerospace Corp Bethpage N Y Research Dept
ENVIRONMENTAL TESTING OF CLOSED PORE INSULATION (CPI). II. SALT SPRAY TESTING,
Carl Feldman, and Michael Russak. Feb 73, 19p Rept no. RM-570
See also AD-756 204.

Descriptors: (*Thermal insulation, Salt spray tests), (*Rendezvous spacecraft, Aerodynamic heating), Atmosphere entry, Manned spacecraft, Lifting reentry vehicles, Heat shields, Heat-resistant glass, Sea water, Fluxes (Fusion), Environmental tests.
Identifiers: Space shuttles, CPI (Closed Pore Insulation), Closed pore insulation.

A series of tests was performed on Grumman-developed surface insulation material, CPI, to demonstrate its suitability for the shuttle orbiter thermal protection system. Salt spray testing was done to determine the effect of sea water mist of CPI's performance during simulated re-entry thermal cycling. This type of testing is mandatory because of the sea coast environment of Cape Kennedy where the shuttle will be launched. CPI-4 was tested and the results gave a good indication of the type and degree of degradation to be expected in actual use. (Author)

N73-15985 PC$3.00/MF$0.95
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
SUPERSONIC AERODYNAMIC CHARACTERISTICS OF A VARIABLE-GEOMETRY SPACECRAFT DESIGNED FOR HIGH HYPERSONIC PERFORMANCE.
B. Spencer, Jr., and R. H. Fournier. Jan 73, 48p
NASA-TM-X-2703, L-8639

Descriptors: *Aerodynamic characteristics, *Hypersonic vehicles, *Spacecraft design, *Supersonic wind tunnels, *Variable geometry structures, Fins, Graphs (charts), Lateral stability, Longitudinal stability, Stabilizers (fluid dynamics).

For abstract, see STAR 11 07.

N73-16221 PC$3.00/MF$0.95
Translation Consultants, Ltd., Arlington, Va.
THE ORION ORBITAL ASTROPHYSICAL OBSERVATORY.
G. A. Gurzadyan, and E. A. Arutyunyan. Jan 73, 9p NASA-TT-F-14581
Contract NASW-2038
Tran- Transl. Into English From Soobshch. Byurakansk. Obs. (USSR, No. 45, 1972 P 12-19

Descriptors: *Astronomical observatories, *Orbital space stations, *Systems engineering, Hot stars, Optical measurement, Salyut space station, Spaceborne telescopes, Spectrograms.

For abstract, see STAR 11 07.

N73-16490 PC$3.00/MF$0.95
Translation Consultants, Ltd., Arlington, Va.
CONTROL SYSTEM FOR AUTOMATIC OPERATION OF THE ORION EQUIPMENT.
M. N. Krmoyan, A. Z. Zakharyan, and S. M. Arutyunyan. Jan 73, 11p NASA-TT-F-14583
Contract NASW-2038
Tran- Transl. Into English From Soobshch. Byurakansk. Observ., Akad. Nauk Arm. Ssr (Erevan), No. 45, 1972 P 27-35

Descriptors: *Astronomical observatories, *Optical tracking, *Orbital space stations, Automatic control, Electromechanical devices, Pulse duration modulation, Systems analysis.

For abstract, see STAR 11 07.

N73-16492 PC$3.00/MF$0.95
Translation Consultants, Ltd., Arlington, Va.
INVESTIGATION OF THE PHOTOGRAPHIC CHARACTERISTICS OF UFSH-4 FILM USED IN THE ORION EQUIPMENT.
V. M. Uvarova, M. R. Shpolskiy, A. N. Oshurkov, D. B. Oganesyan, and N. V. Uvarova. Jan 73, 7p NASA-TT-F-14585
Contract NASW-2038
Tran- Transl. Into English From Soobshch. Byurakansk. Observ., Akad. Nauk Arm. Ssr (Erevan), No. 45, 1972 P 42-47

Descriptors: *Orbital space stations, *Photographic film, *Radiation damage, *Vacuum effects, High resolution, Photographic emulsions, Photographic processing, Ultraviolet radiation, X rays.

For abstract, see STAR 11 07.

N73-16830 PC$3.00/MF$0.95
Translation Consultants, Ltd., Arlington, Va.
ONE PRINCIPAL FOR THE OPERATION OF AN ORBITAL ASTRONOMICAL OBSERVATORY CONTROLLED BY A COSMONAUT.
G. A. Gurzadyan. Jan 73, 7p NASA-TT-F-14580
Contract NASW-2038
Tran- Transl. Into English From Soobshch. Byurakansk. Obs. (USSR, No. 45, 1972 P 5-11

Descriptors: *Astronomical observatories, *Cosmonauts, *High pressure, *Operational problems, Astronomical telescopes, Equipment specifications, Optical measurement.

For abstract, see STAR 11 07.

N73-16872 PC$3.25/MF$0.95
Aerospace Corp., El Segundo, Calif. Systems Engineering Operations.
PAYLOAD ANALYSIS FOR SPACE SHUTTLE APPLICATIONS (STUDY 2.2). VOLUME 4 EXECUTIVE SUMMARY.
Final Report, 1 Oct. 1971 - 31 Aug. 1972
15 Oct 72, 25p NASA-CR-130025, ATR-73 (7312)-1-VOL-4
Contract NASW-2031

Descriptors: *Instrument packages, *Space shuttles, *Space tugs, Nasa programs, Sortie lab, Systems analysis.

For abstract, see STAR 11 07.

N73-16874 PC$24.00/MF$0.95
Sci Systems, Inc., Huntsville, Ala.
A STUDY OF MULTIPLEX DATA BUS TECHNIQUES FOR THE SPACE SHUTTLE.
Final Summary Report
R. J. Kearney, and M. A. Kalange. Nov 72, 436p
NASA-CR-124030, REPT-2635-M15
Contract NAS8-26378

Descriptors: *Data processing terminals, *Data transmission, *Multiplexing, *Space shuttles, Manuals, Reliability engineering, Signal processing.

For abstract, see STAR 11 07.

N73-16875 PC$15.25/MF$0.95
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
EXPERIMENTAL EVALUATION OF THE SKYLAB ORBITAL WORKSHOP VENTILATION SYSTEM CONCEPT.
S. L. Allums, L. J. Hastings, and J. T. Ralston. 14 Mar 72, 265p NASA-TM-X-64700

Descriptors: *Orbital workshops, *Performance tests, *Skylab program, Atmospheric pressure, Human factors engineering, Ventilation fans.

For abstract, see STAR 11 07.

N73-16878 PC$16.25/MF$0.95
General Electric Co., Houston, Tex. Apollo and Ground Systems.
CREW INTERFACE SPECIFICATIONS PREPARATION FOR IN-FLIGHT MAINTENANCE AND STOWAGE FUNCTIONS.
Final Report
F. W. Parker, and B. E. Carlton. 9 Nov 72, 284p
NASA-CR-128685
Contract NAS9-12249

Descriptors: *Manned space flight, *Space maintenance, *Space storage, *Specifications, Intravehicular activity, Spacecraft instruments.

For abstract, see STAR 11 07.

N73-16880 PC$27.50/MF$0.95
Radio Corp. of America, Princeton, N.J. Defense Electronic Products.
ITOS METEOROLOGICAL SATELLITE SYSTEM TIROS M SPACECRAFT (ITOS 1), VOLUME 1.
Final Engineering Report
23 Apr 70, 510p NASA-CR-130163,
AED-R-3318F-VOL-1
Contract NAS5-10306

Descriptors: *Itos 1, *Mission planning, *Spacecraft design, *Tiros m, Command and control, Ground support systems, Systems engineering, Telemetry.

For abstract, see STAR 11 07.

N73-16881 PC$23.00/MF$0.95
Radio Corp. of America, Princeton, N.J. Defense Electronic Products.
ITOS METEOROLOGICAL SATELLITE SYSTEM TIROS M SPACECRAFT (ITOS 1), VOLUME 2.
Final Engineering Report
23 Apr 70, 419p NASA-CR-130164,
AED-R-3318F-VOL-2
Contract NAS5-10306

Descriptors: *Itos 1, *Remote sensors, *Tiros m, Meteorological satellites, Space communication, Spacecraft power supplies, Systems engineering.

For abstract, see STAR 11 07.

N73-16882 PC$29.75/MF$0.95
Radio Corp. of America, Princeton, N.J. Defense Electronic Products.
ITOS METEOROLOGICAL SATELLITE SYSTEM TIROS M SPACECRAFT (ITOS 1), VOLUME 3.
Final Engineering Report
23 Apr 70, 552p NASA-CR-130165,
AED-R-3318F-VOL-3
Contract NAS5-10306

Descriptors: *Acceptability, *Systems engineering, *Tiros m, Meteorological satellites, Performance tests, Quality control, Reliability engineering.

For abstract, see STAR 11 07.

22C. Spacecraft Trajectories and Reentry

AD-757 522 PC$3.00/MF$0.95
Polytechnic Inst of Brooklyn Farmingdale N Y Dept of Aerospace Engineering and Applied Mechanics
PERFORMANCE CHARACTERISTICS OF VEHICLES TRAVELLING IN NEAR-EARTH ORBITS AT SUPERSATELLITE VELOCITIES,
M. H. Bloom, and A. R. Krenkel. Feb 72, 56p Rept no. PIBAL-72-7 AFOSR-TR-73-0504
Contract F44620-71-C-0008

Descriptors: (*Manned spacecraft, *Circular orbit trajectories), Centrifugal fields, Thrust vector control systems, Lifting reentry vehicles, Specific impulse, Fuel consumption, Burning rate, Performance (Engineering).
Identifiers: Supersatellite vehicles, Cruise vehicles, Ballistic trajectories.

The performance of several types of vehicles which have the capability of traversing near-earth circular orbits at supersatellite velocities was investigated. These vehicles use a normal thrust component or negative lift to maintain the circular orbits. Four basic types of vehicles were considered: (a) constant thrust rocket, (b) perpendicular, modulating thrust rocket, (c) inverted glider, and (d) inverted cruise vehicle. Although no particular missions for such flights were envisaged, it is conceivable that supersatellite vehicles (SSV) could be used for reconnaissance, orbital rescue missions, or delivery of high priority payloads in both military and non-military contexts. Specific impulse values of 300 and 600 seconds were studied for all powered stages. (Author Modified Abstract)

N73-16165 PC$7.00/MF$0.95
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SD-4060CPLT4 PROGRAM, USERS GUIDE.
J. Glazer. Jan 73, 97p NASA-TM-X-66164, X-552-73-12
Contract NAS5-11790
Subm- Prepared By Computer Sci. Corp., El Segundo, Calif.

Descriptors: *Computer programs, *Fortran, *Orbit calculation, *Satellite orbits, Ibm 360 computer, Manuals, Orthogonal functions, Plotters.

For abstract, see STAR 11 07.

22D. Spacecraft Launch Vehicles and Ground Support

N73-16879 PC$5.25/MF$0.95
National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
SKYLAB 2 FACILITIES AND ENVIRONMENTAL MEASUREMENTS PROGRAM.
Oct 72, 63p NASA-TM-X-68916, GP-991

Descriptors: *Cape kennedy launch complex, *Monitors, *Skylab program, *Spacecraft launching, Data recording, Environmental control, Ground support systems.

For abstract, see STAR 11 07.

N73-16890 PC$3.50/MF$0.95
Societe Europeenne Detude Et Dintegration de Systems Spatiaux, Courbevoie (France).
INTRODUCTION TO A STUDY OF THE PRINCIPLES OF LAUNCH VEHICLE STRUCTURAL DESIGN . INTRODUCTION A LETUDE DES CRITERES DE DIMENSIONNEMENT DES STRUCTURES DE LANCEURS.
J. Barbe. 26 Mar 71, 28p NT-D3-71.040
Language French

Descriptors: *Launch vehicles, *Structural design criteria, *Structural reliability, Decision making, Dimensional stability, Fail-safe systems, Loads (forces), Safety factors, Structural stability, Structural strain.

For abstract, see STAR 11 07.

REPORT LOCATOR LIST

This list comprises all the reports cited in this issue. It is arranged alpha-numerically by accession number. The subject field and group where the report citation can be located in the journal precedes the accession number.

All of the reports announced in this issue are indexed by corporate author, subject, personal author, contract number, and accession/report number in the companion index **Volume 73, Number 09.**

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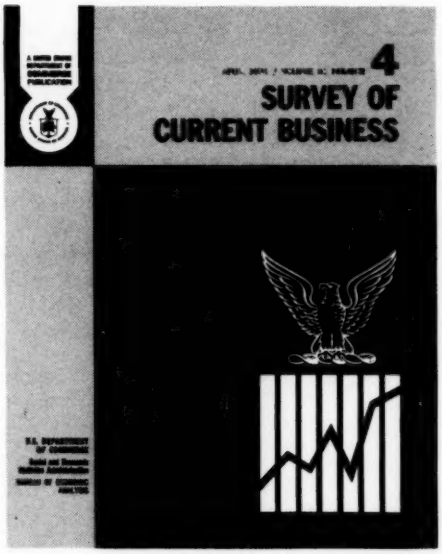

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